STOPPING WATER POLLUTION AT ITS SOURCE

MISA

Municipal/Industrial Strategy for Abatement

ACUTE LETHALITY DATA FOR ONTARIO'S PETROLEUM REFINERY EFFLUENTS COVERING THE PERIOD FROM DECEMBER 1988 TO MAY 1989

JUNE 1990

Ontario

Environment
Environnement

Jim Bradley, Minister/ministre

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MUNICIPAL/INDUSTRIAL STRATEGY FOR ABATEMENT
(MISA)

ACUTE LETHALITY DATA FOR ONTARIO'S PETROLEUM REFINERY EFFLUENTS COVERING THE PERIOD FROM DECEMBER 1988 to MAY 1989

Report Prepared by:
Aquatic Toxicity Unit
Water Resources Branch
Ontario Ministry of the Environment

JUNE 1990

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SUMMARY

Ontario's Regulation under the Environmental Protection Act requires Petroleum Refineries to monitor their discharge (both process and cooling water) to receiving waters for acute lethality to trout and to *Daphnia magna*. The timing of these samples was arranged to coincide with chemical characterization also required under the regulation. The frequency of these samples is monthly for both toxicity test procedures on process effluents with the exception that if tests over three consecutive months show insignificant mortalities with trout then in subsequent months a single concentration test may be used. For cooling waters the required frequency of sampling is quarterly. In both cases the Ministry's test protocols were followed by all laboratories. All toxicity tests required by the regulation were submitted to the Ministry. The following data report presents the toxicity test results of this monitoring along with the results of audit samples that were tested at the Ministry's lab in Rexdale. In addition, toxicity tests on some intake waters were also submitted and these have been included in this report.

Of the more than 50 samples that were tested, only the process effluent at the Petro Canada refinery in Oakville had samples that caused significant mortalities. The sample from March 21, 1989 was toxic to both *Daphnia* and trout. This is explained best by the fact that samples taken on the same day measured more than 27 mg/l zinc. This is clearly above lethal levels. Other contributors to toxicity on this day may have been hexavelant chromium at 0.1 mg/l and unionized ammonia. The sample from April 11 was only toxic to *Daphnia*. At the Rexdale laboratory, toxicity tests with hexavelant chromium were performed and a LC50 value of 0.1 mg/l was determined for *Daphnia*. Since *Daphnia* tend to be slightly more sensitive to hexavelant chromium than trout, a value of 0.26 mg/l may have been lethal to one without being lethal to the other. The third lethal sample collected on December 13, 1989 was only lethal to trout. The toxicants in this sample cannot be determined with certainty. Neither zinc or chromium were measured on this sampling date. However, the ammonia concentration was close to lethal level and may have contributed to the observed lethality. Generally, trout are more sensitive to ammonia than are *Daphnia*.

It is clear that for these organisms, at least, samples from the Petroleum Refineries during this period had little effect on acute lethality.

The chemical characterization for the Petro-Canada refinery in Oakville was also reviewed in terms of other potential impacts. Eliminating the substances that had measured concentrations at or below detection limits, there is left a small list of organic compounds, which some are chlorinated. None of these appear to be present at acute lethal levels or even at chronic effect levels. However, a number of them can transfer to other media by volatilization or sorption to sediment therefore the potential for bioaccumulation should be reviewed.

Common to many of the samples from the Petro-Canada Oakville refinery are

measurable levels of some of the smaller Polycyclic Aromatic Hydrocarbons (PAHs). These chemicals are known to be transformed enzymatically by many aquatic organisms to varying degrees. Fish, for example, are more able to do this than are clams. Clams, therefore, tend to bioaccumulate higher concentrations of PAHs in their tissues. The ability of the organism to metabolize PAHs will not only reduce the amount of PAHs within itself but also reduce the availability for accumulation up the food chain. Although the levels of PAHs may be reduced , the remaining metabolites however can be highly genotoxic. Best known are the 4 and 5 ring PAHs like Benzo-a-pyrene but other PAHs have some of this effect.

Also present are measurable concentrations of two chlorinated hydrocarbons; chloromethane and 1,2 dichloropropane. These are highly volatile and would transfer to the air rapidly and not bioaccumulate. 1,2 Dichloropropane is fairly stable and may distribute through long range transport.

Some of the samples contain measurable amounts of benzene, toluene, xylene, and styrene. These single ring aromatics are generally highly volatile and may also be soluble in water.

There are also some chlorinated aromatics including 2,4,5 trichlorotoluene, 1,2,3,4 tetrachlorobenzene, and octachlorodibenzo-p-dioxin. They do not bioaccumulate but may have other toxic effects. Of the substances found, 2,4,5 trichlortoluene and 1,2,3,4 tetrachlorobenzene represent the most potential hazard, The levels found, however, are considerably lower than known toxic levels. The dioxin found is the least toxic of the dioxins, having approximately 0.0001 times the toxicity of 2,3,7,8 TCDD. These substances may bioaccumulate and would be found primarily associated with particulates. The dioxin, while it has a high log Kow, it is also a large molecule and tends to be non-mobile in the environment.

Creosol, 2,4 dinitrophenol, 4 chloro 3 methyl phenol were found in measurable quantities. These are non-volatile and relatively soluble in water. Therefore their fate is determined primarily by dilution, dispersion, and reaction in the water. They would not be expected to bioaccumulate, but can be highly toxic.

In general, the reporting of toxicity data by the industries went smoothly. The quality of the toxicity results and presentation has been good. All problems have been minor ones which have now been resolved.

None of the audit samples caused significant mortalities to either species which was consistent with the results supplied by the industry. Unfortunately, it was not possible to have the audit samples collected at the same time as one of the industry reported samples. Other split samples with the same consultant labs have indicated that all labs involved are capable of producing comparable results.

COMPANY: Esso Petroleum Canada, Sarnia
(70102)
(now with Sarnia Refinery(Imperial Oil Ltd.))
SECTOR: Petroleum Refining
REGION: Southwest

SUMMARY
The data for six trout bioassays, conducted on process effluent samples collected between December 1988 and May 1989 were provided by Esso Petroleum Canada. All six process effluent samples were determined to have been non-acutely lethal to test fish.

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intake water

process effluent

05880001 sampled: 12/12/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890009 sampled: 01/23/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890010 sampled: 02/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890026 sampled: 03/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890028 sampled: 04/03/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890033 sampled: 05/01/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

01890105 sampled: 05/30/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA audit sample.

Esso Petroleum Canada (continued)

CW-SEP. 11&12

05890017 sampled: 02/14/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890043 sampled: 05/23/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

CW-Sep.9

05890016 sampled: 02/14/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890042 sampled: 05/23/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

CW-Sep.3

05890015 sampled: 02/14/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890041 sampled: 05/23/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

EO-Sep.14 outlet

EO-Sep.10

EO-Sep.5

EO-tank area-ditch

EO-filter-Sep.11&12

EO-Sep.14 inlet

EO-impounding basin

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05880001

TEST CONDITIONS

Company	: Esso Petroleum Canada Sarnia, ONT (70102)
Region	: Southwest
Industry	: Petroleum Refining
Control point	: process effluent, (300)
Laboratory	: Pollutech
Sampling Method	: water
Sampled By	: T. Moran
Date Collected	: 12/12/88
Received	: 12/12/88
Tested	: 12/13/88 at: 1130
Type of Bioassay	: STATIC (Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).
Test Animal	: Rainbow trout
Weight(gm)	:
Length(mm)	:

MORTALITY DATA

TEST CONC.	ELAPSED TIME								TOTAL MORTALITY
%	00:00	02:10	03:10	05:25	22:10	46:10	70:00	95:00	%
100	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05880001

TEST CONC. %		ELAPSED TIME 00:00	02:10	03:10	05:25	22:10	46:10	70:00	95:00
100	pH	7.0				7.4	7.4	7.5	7.4
	O2 ppm	9.8				9.2	9.2	9.6	9.4
	Cond.	710							750
	Temp(C)	15.0				15.0	15.0	15.0	15.0
75	pH	7.0				7.5	7.5	7.6	7.5
	O2 ppm	10.0				9.5	9.3	9.7	9.6
	Cond.	550							600
	Temp(C)	15.0				15.0	15.0	15.0	15.0
56	pH	7.1				7.5	7.6	7.6	7.6
	O2 ppm	10.2				9.6	9.2	9.9	9.7
	Cond.	450							470
	Temp(C)	15.0				15.0	15.0	15.0	15.0
25	pH	7.0				7.5	7.5	7.6	7.6
	O2 ppm	10.4				9.8	9.7	9.9	9.8
	Cond.	320							325
	Temp(C)	15.0				15.0	15.0	15.0	15.0
10	pH	7.0				7.5	7.6	7.6	7.6
	O2 ppm	10.5				9.9	9.8	10.0	9.7
	Cond.	230							258
	Temp(C)	15.0				15.0	15.0	15.0	15.0
1	pH	7.0				7.6	7.6	7.6	7.7
	O2 ppm	10.5				9.8	9.8	10.1	10.1
	Cond.	162							170
	Temp(C)	15.0				15.0	15.0	15.0	15.0
Control	pH	7.0				7.6	7.7	7.6	7.6
	O2 ppm	10.2				10.0	10.0	10.1	10.2
	Cond.	162							168
	Temp(C)	15.0				15.0	15.0	15.0	15.0
Control	pH	7.1				7.6	7.6	7.6	7.6
	O2 ppm	10.3				10.3	10.1	10.2	10.1
	Cond.	162							168
	Temp(C)	15.0				15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890009

TEST CONDITIONS

Company	: Esso Petroleum Canada Sarnia, ONT (70102)
Region	: Southwest
Industry	: Petroleum Refining
Control point	: process effluent, (300)
Laboratory	: Pollutech
Sampling Method	: grab
Sampled By	: C. Ferguson
Date Collected	: 01/23/89
Received	: 01/23/89
Tested	: 01/24/89 at: 1700
Type of Bioassay	: STATIC (Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).
Test Animal	: Rainbow trout
Weight(gm)	:
Length(mm)	:

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	17:00	42:00	65:30	93:30	TOTAL MORTALITY %
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890009

TEST CONC. %		ELAPSED TIME 00:00	17:00	42:00	65:30	93:30
100	pH	7.1	7.4	7.4	7.4	7.4
	O2 ppm	8.0	9.8	10.0	9.8	9.0
	Cond.	800				850
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.1	7.5	7.4	7.5	7.4
	O2 ppm	8.2	10.0	10.1	10.0	9.8
	Cond.	670				710
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.1	7.6	7.5	7.5	7.4
	O2 ppm	9.9	10.2	10.1	10.2	9.6
	Cond.	470				485
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.1	7.6	7.5	7.6	7.5
	O2 ppm	10.2	10.2	10.0	10.2	9.7
	Cond.	300				315
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.2	7.6	7.4	7.6	7.5
	O2 ppm	10.0	10.0	9.8	10.0	9.8
	Cond.	220				285
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.3	7.6	7.4	7.6	7.6
	O2 ppm	10.2	10.2	10.2	10.0	9.9
	Cond.	172				192
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.6	7.4	7.4	7.4
	O2 ppm	10.2	10.2	10.0	9.9	9.9
	Cond.	162				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.5	7.4	7.5	7.4
	O2 ppm	10.3	10.2	9.9	9.8	9.8
	Cond.	165				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890010

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : process effluent, (300)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 02/06/89
Received : 02/06/89
Tested : 02/07/89 at: 1615

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	21:25	45:15	70:25	95:15	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
50	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890010

TEST CONC. %		ELAPSED TIME 00:00	21:25	45:15	70:25	95:15
100	pH	6.8	7.3	7.3	7.2	7.3
	O2 ppm	8.0	9.3	9.4	9.0	9.0
	Cond.	980				890
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.0	7.5	7.4	7.2	7.3
	O2 ppm	9.0	9.2	9.4	8.8	9.8
	Cond.	680				680
	Temp(C)	15.0	15.0	15.0	15.0	15.0
50	pH	7.1	7.5	7.3	7.3	7.4
	O2 ppm	9.6	9.2	9.2	9.1	8.5
	Cond.	535				550
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.3	7.7	7.5	7.5	7.5
	O2 ppm	10.4	9.5	8.4	9.3	9.4
	Cond.	320				325
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.4	7.8	7.5	7.5	7.6
	O2 ppm	10.8	9.7	9.6	9.4	9.2
	Cond.	225				232
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.4	7.9	7.5	7.5	7.7
	O2 ppm	11.0	9.7	9.8	9.6	9.5
	Cond.	170				190
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.7	7.5	7.6	7.6
	O2 ppm	10.8	9.8	9.9	10.0	9.7
	Cond.	162				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.6	7.4	7.5	7.6
	O2 ppm	11.0	9.8	9.8	9.9	9.7
	Cond.	162				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890026

TEST CONDITIONS

Company	: Esso Petroleum Canada Sarnia, ONT (70102)
Region	: Southwest
Industry	: Petroleum Refining
Control point	: process effluent, (300)
Laboratory	: Pollutech
Sampling Method	: Grab
Sampled By	: C. Ferguson
Date Collected	: 03/06/89
Received	: 03/06/89
Tested	: 03/07/89 at: 1530
Type of Bioassay	: STATIC (Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).
Test Animal	: Rainbow trout
Weight(gm)	:
Length(mm)	:

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	20:00	49:10	68:00	94:10	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890026

TEST CONC. %		ELAPSED TIME 00:00	20:00	49:10	68:00	94:10
100	pH	7.0	7.5	7.4	7.4	7.4
	O2 ppm	7.8	9.0	9.5	10.0	9.7
	Cond.	600				680
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.0	7.4	7.5	7.4	7.5
	O2 ppm	7.6	9.2	9.6	10.0	9.8
	Cond.	600				690
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.5	7.6	7.5	7.7
	O2 ppm	10.0	9.8	10.1	10.2	10.2
	Cond.	168				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.5	7.6	7.6	7.7
	O2 ppm	9.9	9.6	9.8	10.2	10.2
	Cond.	178				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890028

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : process effluent, (300)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 04/03/89
Received : 04/03/89
Tested : 04/04/89 at: 1330

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	19:15	46:10	69:00	95:10	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890028

TEST CONC.		ELAPSED TIME				
%		00:00	19:15	46:10	69:00	95:10
100	pH	6.9	7.3	7.3	7.3	7.4
	O2 ppm	7.4	8.2	9.0	9.2	9.2
	Cond.	550				550
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	6.9	7.3	7.3	7.4	7.4
	O2 ppm	7.6	9.0	9.2	9.3	9.2
	Cond.	550				550
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.3	7.6	7.3	7.5
	O2 ppm	10.2	9.2	10.1	9.9	10.0
	Cond.	162				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.4	7.6	7.4	7.5
	O2 ppm	10.2	9.2	10.2	10.0	10.0
	Cond.	162				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890033

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : process effluent, (300)

Laboratory : Pollutech
Sampling Method : grab
Sampled By : C. Ferguson
Date Collected : 05/01/89
Received : 05/01/89
Tested : 05/02/89 at: 1400

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	21:30	47:30	72:30	97:30	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890033

TEST CONC. %		ELAPSED TIME 00:00	21:30	47:30	72:30	97:30
100	pH	6.8	7.5	7.4	7.4	7.2
	O2 ppm	7.8	9.8	8.6	9.0	9.6
	Cond.	660				650
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	6.8	7.5	7.4	7.4	7.2
	O2 ppm	7.6	9.6	8.6	9.0	9.5
	Cond.	660				650
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.6	7.6	7.6	7.3
	O2 ppm	10.6	9.8	9.3	9.8	10.1
	Cond.	158				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.6	7.6	7.5	7.3
	O2 ppm	10.4	10.0	9.4	9.9	10.0
	Cond.	158				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 01890105

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : process effluent, (300)

Laboratory : MOE
Sampling Method : grab
Sampled By : D. Hamilton
Date Collected : 05/30/89
Received : 05/30/89
Tested : 05/31/89 at: 930

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME						TOTAL MORTALITY
%	00:00	02:10	24:00	48:10	75:30	98:10	%
100	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : MISA audit sample.

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 01890105

TEST CONC. %		ELAPSED TIME 00:00	02:10	24:00	48:10	75:30	98:10
100	pH	7.0	7.3	7.6	7.5	7.3	7.2
	O2 ppm	8.7	10.2	9.5	9.6	9.6	9.3
	Cond.	510	510	540	560	540	525
	Temp(C)	14.0	14.0	15.0	15.0	15.0	15.0
65	pH		7.4	7.6	7.6	6.7	7.2
	O2 ppm		10.0	9.6	9.7	9.7	9.4
	Cond.		445	450	450	460	450
	Temp(C)		14.0	15.0	15.0	15.0	15.0
40	pH		7.5	7.7	7.6	6.8	7.3
	O2 ppm		10.0	9.7	9.7	9.7	9.4
	Cond.		374	375	370	390	350
	Temp(C)		14.0	15.0	15.0	15.0	15.0
30	pH		7.5	7.6	7.6	8.1	7.3
	O2 ppm		9.9	9.7	9.7	9.7	9.5
	Cond.		335	345	345	330	340
	Temp(C)		14.0	15.0	15.0	15.0	15.0
20	pH		7.4	7.7	7.5	8.1	7.3
	O2 ppm		9.8	9.6	9.7	9.8	9.4
	Cond.		315	315	315	320	280
	Temp(C)		14.0	15.0	15.0	15.0	15.0
10	pH		7.4	7.6	7.5	8.1	7.3
	O2 ppm		9.7	9.6	9.6	9.9	9.4
	Cond.		285	280	285	280	275
	Temp(C)		14.0	15.0	15.0	15.0	15.0
Control	pH		7.7	7.1	7.4	8.1	7.3
	O2 ppm		9.7	9.8	9.8	9.7	9.5
	Cond.		260	260	260	260	260
	Temp(C)		14.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890017

TEST CONDITIONS

Company	: Esso Petroleum Canada Sarnia, ONT (70102)
Region	: Southwest
Industry	: Petroleum Refining
Control point	: CW-SEP. 11&12, (400)
Laboratory	: Pollutech
Sampling Method	: Grab
Sampled By	: C. Ferguson
Date Collected	: 02/14/89
Received	: 02/14/89
Tested	: 02/15/89 at: 1315
Type of Bioassay	: STATIC (Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).
Test Animal	: Rainbow trout
Weight(gm)	:
Length(mm)	:

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	21:25	46:25	72:30	95:15	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890017

TEST CONC. %		ELAPSED TIME 00:00	21:25	46:25	72:30	95:15
100	pH	7.9	7.6	7.6	7.6	7.6
	O2 ppm	8.4	9.4	9.4	9.8	9.7
	Cond.	188				190
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.8	7.6	7.6	7.6	7.6
	O2 ppm	9.0	9.8	9.3	9.8	9.8
	Cond.	184				188
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.7	7.7	7.6	7.6	7.7
	O2 ppm	9.2	9.6	9.7	9.8	9.8
	Cond.	182				185
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.6	7.6	7.6	7.5	7.6
	O2 ppm	9.4	9.4	9.3	9.6	10.0
	Cond.	178				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.6	7.6	7.6	7.6	7.6
	O2 ppm	9.6	9.6	9.8	9.8	10.1
	Cond.	176				180
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.6	7.5	7.6	7.6	7.6
	O2 ppm	9.6	9.6	9.8	10.0	10.0
	Cond.	174				180
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.4	7.7	7.6	7.6	7.7
	O2 ppm	10.6	9.9	10.6	10.2	10.2
	Cond.	174				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.4	7.6	7.5	7.6	7.7
	O2 ppm	10.6	9.9	10.3	10.1	10.3
	Cond.	174				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890043

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : CW-SEP. 11&12, (400)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 05/23/89
Received : 05/23/89
Tested : 05/24/89 at: 1230

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	24:00	52:10	75:10	97:10	TOTAL MORTALITY %
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890043

TEST CONC. %		ELAPSED TIME 00:00	24:00	52:10	75:10	97:10
100	pH	8.2	7.5	7.5	7.4	7.5
	O2 ppm	9.0	9.4	8.4	9.3	9.7
	Cond.	178				187
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.8	7.5	7.5	7.4	7.5
	O2 ppm	9.2	9.5	8.5	9.6	9.7
	Cond.	176				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.5	7.4	7.5	7.4	7.5
	O2 ppm	9.5	9.5	9.5	9.2	9.6
	Cond.	174				179
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.3	7.3	7.4	7.3	7.4
	O2 ppm	9.7	9.5	8.6	9.2	9.1
	Cond.	172				185
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.2	7.3	7.4	7.3	7.4
	O2 ppm	9.9	9.1	8.4	8.6	9.1
	Cond.	170				175
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.2	7.3	7.5	7.3	7.4
	O2 ppm	9.9	9.3	8.4	8.7	9.2
	Cond.	170				173
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.4	7.4	7.3	7.4
	O2 ppm	9.9	9.7	8.4	9.8	9.6
	Cond.	172				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.3	7.3	7.3	7.3
	O2 ppm	9.8	9.5	8.6	9.0	9.6
	Cond.	174				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890016

TEST CONDITIONS

Company	: Esso Petroleum Canada Sarnia, ONT (70102)
Region	: Southwest
Industry	: Petroleum Refining
Control point	: CW-Sep.9, (500)
Laboratory	: Pollutech
Sampling Method	: Grab
Sampled By	: C. Ferguson
Date Collected	: 02/14/89
Received	: 02/14/89
Tested	: 02/15/89 at: 1315
Type of Bioassay	: STATIC (Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).
Test Animal	: Rainbow trout
Weight(gm)	:
Length(mm)	:

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	21:25	51:25	72:30	95:15	TOTAL MORTALITY %
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890016

TEST CONC. %		ELAPSED TIME 00:00	21:25	51:25	72:30	95:15
100	pH	7.8	7.5	7.6	7.6	7.7
	O2 ppm	8.0	10.0	9.6	9.7	10.0
	Cond.	720				740
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.7	7.6	7.6	7.6	7.7
	O2 ppm	8.1	9.8	9.4	9.6	10.0
	Cond.	560				600
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.6	7.5	7.5	7.4	7.7
	O2 ppm	8.2	9.6	9.6	9.6	10.1
	Cond.	460				458
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.5	7.5	7.6	7.5	7.6
	O2 ppm	9.4	9.9	9.4	9.6	9.9
	Cond.	320				310
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.5	7.5	7.5	7.5	7.6
	O2 ppm	9.4	9.9	9.6	9.8	10.2
	Cond.	220				225
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.5	7.5	7.6	7.5	7.6
	O2 ppm	9.4	9.6	9.7	10.1	10.2
	Cond.	180				195
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.4	7.7	7.6	7.6	7.7
	O2 ppm	10.6	9.9	10.6	10.2	10.2
	Cond.	174				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.4	7.6	7.5	7.6	7.7
	O2 ppm	10.6	9.6	10.3	10.1	10.3
	Cond.	174				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0

NISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890042

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : CW-Sep.9, (500)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 05/23/89
Received : 05/23/89
Tested : 05/24/89 at: 1230

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	52:10	75:10	97:10	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890042

TEST CONC. %		ELAPSED TIME 00:00	24:00	52:10	75:10	97:10
100	pH	7.8	7.4	7.4	7.3	7.3
	O2 ppm	9.6	9.4	8.7	9.1	9.3
	Cond.	620				650
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.5	7.3	7.4	7.3	7.3
	O2 ppm	9.4	9.2	8.5	9.1	9.3
	Cond.	520				530
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.3	7.3	7.3	7.2	7.3
	O2 ppm	9.5	9.5	8.2	9.4	9.4
	Cond.	410				410
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.2	7.2	7.3	7.3	7.4
	O2 ppm	9.5	9.6	8.3	9.0	9.4
	Cond.	292				295
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.2	7.3	7.3	7.2	7.4
	O2 ppm	9.6	9.4	8.4	9.1	9.2
	Cond.	210				210
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.2	7.2	7.3	7.3	7.4
	O2 ppm	9.8	9.5	8.4	8.5	8.8
	Cond.	180				179
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.4	7.4	7.3	7.4
	O2 ppm	9.9	9.7	8.4	9.8	9.6
	Cond.	172				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.3	7.3	7.3	7.3
	O2 ppm	9.8	9.5	8.6	9.0	9.6
	Cond.	174				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890015

TEST CONDITIONS

Company	: Esso Petroleum Canada Sarnia, ONT (70102)
Region	: Southwest
Industry	: Petroleum Refining
Control point	: CW-Sep.3, (600)
Laboratory	: Pollutech
Sampling Method	: Grab
Sampled By	: C. Ferguson
Date Collected	: 02/14/89
Received	: 02/14/89
Tested	: 02/15/89 at: 1315
Type of Bioassay	: STATIC (Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).
Test Animal	: Rainbow trout
Weight(gm)	:
Length(mm)	:

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	21:25	51:25	72:30	95:25	TOTAL MORTALITY %
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	1	10
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890015

TEST CONC. %		ELAPSED TIME 00:00	21:25	51:25	72:30	95:25
100	pH	7.7	7.7	7.7	7.6	7.6
	O2 ppm	8.2	9.9	9.6	9.9	10.2
	Cond.	174				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.6	7.5	7.6	7.5	7.5
	O2 ppm	8.2	9.6	9.5	9.6	9.8
	Cond.	174				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.6	7.6	7.6	7.6	7.6
	O2 ppm	8.2	9.6	9.9	9.8	9.9
	Cond.	172				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.6	7.6	7.6	7.6	7.6
	O2 ppm	8.2	9.7	9.7	9.9	10.0
	Cond.	174				179
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.6	7.6	7.6	7.6	7.6
	O2 ppm	8.1	9.8	9.8	10.0	10.1
	Cond.	176				179
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.5	7.5	7.6	7.6	7.5
	O2 ppm	8.2	9.9	9.9	10.0	9.8
	Cond.	176				180
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.4	7.7	7.6	7.6	7.7
	O2 ppm	10.6	9.9	10.6	10.2	10.2
	Cond.	174				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.4	7.6	7.5	7.6	7.7
	O2 ppm	10.6	9.6	10.3	10.1	10.3
	Cond.	174				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT — Sample: 05890041

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : CW-Sep.3, (600)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 05/23/89
Received : 05/23/89
Tested : 05/24/89 at: 1230

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	24:00	49:00	75:10	97:10	TOTAL MORTALITY %
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890041

TEST CONC. %		ELAPSED TIME 00:00	24:00	49:00	75:10	97:10
100	pH	7.7	7.4	7.3	7.3	7.3
	O2 ppm	9.7	9.9	8.7	9.1	9.8
	Cond.	170				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.4	7.3	7.4	7.2	7.3
	O2 ppm	9.8	9.9	8.6	8.8	9.1
	Cond.	170				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.2	7.2	7.4	7.2	7.3
	O2 ppm	9.7	9.8	8.4	8.7	9.1
	Cond.	172				175
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.1	7.1	7.3	7.2	7.3
	O2 ppm	9.8	9.6	8.2	8.6	8.8
	Cond.	172				175
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.1	7.1	7.3	7.2	7.3
	O2 ppm	9.8	9.5	8.4	9.2	9.2
	Cond.	174				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0
	pH	7.1	7.1	7.4	7.3	7.3
	O2 ppm	9.8	9.4	8.4	9.1	9.0
	Cond.	174				180
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.4	7.4	7.3	7.4
	O2 ppm	9.9	9.7	8.4	9.8	9.6
	Cond.	172				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.3	7.3	7.3	7.3
	O2 ppm	9.8	9.5	8.6	9.0	9.6
	Cond.	174				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0

COMPANY: Esso Petroleum Canada, Sarnia
(70102)
(now with Sarnia Refinery(Imperial Oil Ltd.))
SECTOR: Petroleum Refining
REGION: Southwest

SUMMARY

Data for six Daphnia magna acute lethality toxicity tests conducted on samples of Process Effluent collected between December 1988 and May 1989 were provided by Esso Petroleum Canada in Sarnia. All six of these samples were determined to be not acutely lethal to Daphnia.

Toxicity tests were also conducted on two samples from each of CW.-Sep 3, CW.-Sep 9, and CW.-Sep 11&12 sampling points. All six samples were not acutely lethal to Daphnia magna.

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intake water

process effluent

05880001 sampled: 12/12/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890009 sampled: 01/23/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890010 sampled: 02/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890026 sampled: 03/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890028 sampled: 04/03/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890033 sampled: 05/01/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

02890105 sampled: 05/30/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

CW-SEP. 11&12

05890017 sampled: 02/14/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890043 sampled: 05/23/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

CW-Sep.9

05890016 sampled: 02/14/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890042 sampled: 05/23/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

CW-Sep.3

05890015 sampled: 02/14/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890041 sampled: 05/23/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

EO-Sep.14 outlet

EO-Sep.10

EO-Sep.5

EO-tank area-ditch

EO-filter-Sep.11&12

EO-Sep.14 inlet

EO-impounding basin

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05880001

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : process effluent, (300)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T.Moran
Date Collected : 12/12/88
Received : 12/12/88
Tested : 12/13/88 at: 1100

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME 00:00	47:00	TOTAL MORTALITY
%			%
100	0	0	0
50	0	0	0
26	0	1	8
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05880001

TEST CONC. %		ELAPSED TIME 00:00	47:00
100	pH	7.1	7.3
	O2 ppm	8.0	8.8
	Cond.	800	800
	Temp(C)	20.0	20.0
50	pH	7.6	7.5
	O2 ppm	8.7	9.1
	Cond.	700	700
	Temp(C)	20.0	20.0
26	pH	7.9	7.9
	O2 ppm	8.9	9.3
	Cond.	600	650
	Temp(C)	20.0	20.0
13	pH	8.0	8.0
	O2 ppm	9.1	9.4
	Cond.	620	625
	Temp(C)	20.0	20.0
6	pH	8.0	8.0
	O2 ppm	9.2	9.4
	Cond.	600	600
	Temp(C)	20.0	20.0
Control	pH	8.1	8.0
	O2 ppm	9.3	9.4
	Cond.	600	600
	Temp(C)	20.0	20.0

NISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890009

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : process effluent, (300)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T. Moran
Date Collected : 01/23/89
Received : 01/23/89
Tested : 01/24/89 at: 930

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	51:00	%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890009

TEST CONC. %		ELAPSED TIME 00:00	51:00
100	pH	7.2	7.4
	O2 ppm	8.7	8.4
	Cond.	380	1000
	Temp(C)	20.0	20.0
50	pH	7.6	7.7
	O2 ppm	9.0	8.2
	Cond.	710	800
	Temp(C)	20.0	20.0
26	pH	7.8	7.8
	O2 ppm	9.2	8.4
	Cond.	650	700
	Temp(C)	20.0	20.0
13	pH	8.0	7.8
	O2 ppm	9.2	8.6
	Cond.	600	650
	Temp(C)	20.0	20.0
6	pH	8.0	7.9
	O2 ppm	9.3	8.4
	Cond.	600	650
	Temp(C)	20.0	20.0
Control	pH	8.0	7.6
	O2 ppm	9.3	9.0
	Cond.	580	600
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890010

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : process effluent, (300)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 02/06/89
Received : 02/06/89
Tested : 02/06/89 at: 1735

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	47:35	%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890010

TEST CONC. %		ELAPSED TIME 00:00	47:35
100	pH	7.0	7.3
	O2 ppm	6.2	7.4
	Cond.	920	820
	Temp(C)	20.0	20.0
50	pH	7.4	7.7
	O2 ppm	7.6	7.4
	Cond.	740	740
	Temp(C)	20.0	20.0
26	pH	7.6	7.9
	O2 ppm	8.0	7.8
	Cond.	660	700
	Temp(C)	20.0	20.0
13	pH	8.0	8.0
	O2 ppm	8.2	7.9
	Cond.	620	640
	Temp(C)	20.0	20.0
6	pH	8.0	8.0
	O2 ppm	8.6	8.4
	Cond.	600	620
	Temp(C)	20.0	20.0
Control	pH	8.0	8.1
	O2 ppm	8.6	8.4
	Cond.	540	620
	Temp(C)	20.0	20.0

NISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890026

TEST CONDITIONS

Company	: Esso Petroleum Canada Sarnia, ONT (70102)
Region	: Southwest
Industry	: Petroleum Refining
Control point	: process effluent, (300)
Laboratory	: Pollutech
Sampling Method	: Grab
Sampled By	: C. Ferguson
Date Collected	: 03/06/89
Received	: 03/06/89
Tested	: 03/07/89 at: 1400
Type of Bioassay	: STATIC (Daphnia magna Acute Lethality Toxicity Test Protocol. OME, 1988)
Test Animal	: D. magna
Weight(gm)	:
Length(mm)	:

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	47:30	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50	: Non-lethal
95% fid. limits	: 0.0 - 0.0 %
Comments	:

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890026

TEST CONC. %		ELAPSED TIME 00:00	47:30
100	pH	6.9	7.4
	O2 ppm	9.0	8.6
	Cond.	690	680
	Temp(C)	20.0	20.0
50	pH	7.5	7.8
	O2 ppm	9.1	8.6
	Cond.	630	650
	Temp(C)	20.0	20.0
26	pH	7.8	7.9
	O2 ppm	9.0	8.9
	Cond.	610	620
	Temp(C)	20.0	20.0
13	pH	8.0	8.0
	O2 ppm	9.0	9.2
	Cond.	600	610
	Temp(C)	20.0	20.0
6	pH	8.0	8.0
	O2 ppm	8.9	9.4
	Cond.	600	610
	Temp(C)	20.0	20.0
Control	pH	8.1	8.0
	O2 ppm	9.1	9.4
	Cond.	600	610
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890028

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : process effluent, (300)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 04/03/89
Received : 04/03/89
Tested : 04/04/89 at: 1430

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	49:30	TOTAL MORTALITY %
100	0	0	0
50	0	1	8
26	0	0	0
13	0	1	8
6	0	1	8
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890028

TEST CONC. %		ELAPSED TIME 00:00	49:30
100	pH	6.9	7.4
	O2 ppm	7.6	8.4
	Cond.	540	610
	Temp(C)	20.0	20.0
50	pH	7.3	7.7
	O2 ppm	8.3	8.9
	Cond.	540	600
	Temp(C)	20.0	20.0
26	pH	7.7	7.8
	O2 ppm	8.7	9.1
	Cond.	520	590
	Temp(C)	20.0	20.0
13	pH	7.9	7.9
	O2 ppm	8.8	9.0
	Cond.	520	580
	Temp(C)	20.0	20.0
6	pH	8.0	7.9
	O2 ppm	8.8	9.0
	Cond.	520	550
	Temp(C)	20.0	20.0
Control	pH	8.0	7.9
	O2 ppm	9.2	9.3
	Cond.	520	550
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890033

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : process effluent, (300)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 05/01/89
Received : 05/01/89
Tested : 05/03/89 at: 945

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	49:05	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890033

TEST CONC. %		ELAPSED TIME 00:00	49:05
100	pH	7.0	7.1
	O2 ppm	8.6	8.2
	Cond.	700	790
	Temp(C)	20.0	20.0
50	pH	7.5	7.7
	O2 ppm	9.4	8.4
	Cond.	600	620
	Temp(C)	20.0	20.0
26	pH	7.7	7.8
	O2 ppm	9.4	9.2
	Cond.	540	590
	Temp(C)	20.0	20.0
13	pH	7.9	7.9
	O2 ppm	9.6	9.3
	Cond.	500	530
	Temp(C)	20.0	20.0
6	pH	7.9	8.0
	O2 ppm	9.6	9.3
	Cond.	500	520
	Temp(C)	20.0	20.0
Control	pH	8.0	8.0
	O2 ppm	9.8	9.3
	Cond.	490	510
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 02890105

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : process effluent, (300)

Laboratory : MOE
Sampling Method : grab
Sampled By : D. Hamilton
Date Collected : 05/30/89
Received : 05/30/89
Tested : 05/31/89 at: 1000

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	01:00	24:00	48:00	TOTAL MORTALITY %
100	0	0	0	0	0
60	0	0	0	0	0
30	0	0	0	0	0
15	0	0	0	0	0
5	0	0	0	1	8
Control	0	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : MISA Audit

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 02890105

TEST CONC. %		ELAPSED TIME 00:00	01:00	24:00	48:00
100	pH	7.5			8.0
	O2 ppm	9.2			8.5
	Cond.	683			652
	Temp(C)	20.0	20.0	20.0	20.0
60	pH	7.8			8.1
	O2 ppm	9.7			8.5
	Cond.	521			515
	Temp(C)	20.0	20.0	20.0	20.0
30	pH	8.0			8.2
	O2 ppm	9.8			8.6
	Cond.	420			412
	Temp(C)	20.0	20.0	20.0	20.0
15	pH	8.1			8.3
	O2 ppm	9.8			8.6
	Cond.	362			359
	Temp(C)	20.0	20.0	20.0	20.0
5	pH	8.2			8.3
	O2 ppm	9.7			8.6
	Cond.	328			326
	Temp(C)	20.0	20.0	20.0	20.0
Control	pH	8.2			8.3
	O2 ppm	9.6			8.6
	Cond.	313			306
	Temp(C)	20.0	20.0	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890017

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : CW-SEP. 11&12, (400)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 02/14/89
Received : 02/14/89
Tested : 02/15/89 at: 1625

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	48:15	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890017

TEST CONC. %		ELAPSED TIME 00:00	48:15
100	pH	8.1	7.9
	O2 ppm	8.8	9.2
	Cond.	208	210
	Temp(C)	20.0	20.0
50	pH	8.0	7.9
	O2 ppm	8.6	9.3
	Cond.	410	400
	Temp(C)	20.0	20.0
26	pH	8.0	8.0
	O2 ppm	8.6	9.3
	Cond.	500	510
	Temp(C)	20.0	20.0
13	pH	8.0	8.0
	O2 ppm	8.8	9.0
	Cond.	490	550
	Temp(C)	20.0	20.0
6	pH	8.0	8.0
	O2 ppm	8.8	9.2
	Cond.	600	600
	Temp(C)	20.0	20.0
Control	pH	8.0	7.9
	O2 ppm	9.0	9.0
	Cond.	640	630
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890043

TEST CONDITIONS

Company	: Esso Petroleum Canada Sarnia, ONT (70102)
Region	: Southwest
Industry	: Petroleum Refining
Control point	: CW-SEP. 11&12, (400)
Laboratory	: Pollutech
Sampling Method	: Grab
Sampled By	: C.Ferguson
Date Collected	: 05/23/89
Received	: 05/23/89
Tested	: 05/26/89 at: 1030
Type of Bioassay	: STATIC (Daphnia magna Acute Lethality Toxicity Test Protocol. ONE, 1988)
Test Animal	: D. magna
Weight(gm)	:
Length(mm)	:

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	50:10	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890043

TEST CONC. %		ELAPSED TIME 00:00	50:10
100	pH	8.0	7.9
	O2 ppm	10.2	9.5
	Cond.	192	210
	Temp(C)	20.0	20.0
50	pH	8.0	8.0
	O2 ppm	10.0	9.5
	Cond.	348	352
	Temp(C)	20.0	20.0
26	pH	8.0	8.1
	O2 ppm	9.9	9.5
	Cond.	420	418
	Temp(C)	20.0	20.0
13	pH	8.0	8.1
	O2 ppm	9.8	9.6
	Cond.	458	445
	Temp(C)	20.0	20.0
6	pH	8.0	8.1
	O2 ppm	9.9	9.6
	Cond.	480	459
	Temp(C)	20.0	20.0
Control	pH	7.9	8.1
	O2 ppm	9.8	9.4
	Cond.	498	455
	Temp(C)	20.0	20.0

NISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890016

TEST CONDITIONS

Company	: Esso Petroleum Canada Sarnia, ONT (70102)
Region	: Southwest
Industry	: Petroleum Refining
Control point	: CW-Sep.9, (500)
Laboratory	: Pollutech
Sampling Method	: Grab
Sampled By	: C. Ferguson
Date Collected	: 02/14/89
Received	: 02/14/89
Tested	: 02/15/89 at: 1550
Type of Bioassay	: STATIC (Daphnia magna Acute Lethality Toxicity Test Protocol. ONE, 1988)
Test Animal	: D. magna
Weight(gm)	:
Length(mm)	:

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 01:15	48:50	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890016

TEST CONC. %		ELAPSED TIME 01:15	48:50
100	pH	7.9	7.8
	O2 ppm	9.6	9.4
	Cond.	760	800
	Temp(C)	20.0	20.0
50	pH	7.8	7.9
	O2 ppm	9.2	9.3
	Cond.	700	700
	Temp(C)	20.0	20.0
26	pH	7.9	7.9
	O2 ppm	9.0	9.4
	Cond.	680	680
	Temp(C)	20.0	20.0
13	pH	7.8	7.9
	O2 ppm	9.0	9.4
	Cond.	680	680
	Temp(C)	20.0	20.0
6	pH	7.7	7.9
	O2 ppm	8.8	9.2
	Cond.	680	660
	Temp(C)	20.0	20.0
Control	pH	8.0	7.9
	O2 ppm	9.0	9.0
	Cond.	640	660
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890042

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : CW-Sep.9, (500)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 05/23/89
Received : 05/23/89
Tested : 05/23/89 at: 1530

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	48:00	%
100	0	1	8
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890042

TEST CONC. %		ELAPSED TIME 00:00	48:00
100	pH	7.8	7.7
	O2 ppm	8.6	8.7
	Cond.	680	700
	Temp(C)	20.0	20.0
50	pH	7.9	7.8
	O2 ppm	9.0	8.9
	Cond.	580	600
	Temp(C)	20.0	20.0
26	pH	7.9	7.9
	O2 ppm	9.0	9.2
	Cond.	520	530
	Temp(C)	20.0	20.0
13	pH	7.9	7.9
	O2 ppm	9.0	9.4
	Cond.	500	505
	Temp(C)	20.0	20.0
6	pH	7.9	7.9
	O2 ppm	9.0	9.4
	Cond.	488	505
	Temp(C)	20.0	20.0
Control	pH	7.9	7.9
	O2 ppm	9.4	9.4
	Cond.	478	489
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890015

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : CW-Sep.3, (600)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 02/14/89
Received : 02/14/89
Tested : 02/15/89 at: 1515

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	47:25	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890015

TEST CONC. %		ELAPSED TIME 00:00	47:25
100	pH	7.6	7.7
	O2 ppm	10.4	9.5
	Cond.	192	210
	Temp(C)	20.0	20.0
50	pH	7.7	7.8
	O2 ppm	9.4	9.4
	Cond.	410	420
	Temp(C)	20.0	20.0
26	pH	7.7	7.9
	O2 ppm	9.2	9.4
	Cond.	520	520
	Temp(C)	20.0	20.0
13	pH	7.7	7.9
	O2 ppm	9.0	9.5
	Cond.	580	600
	Temp(C)	20.0	20.0
6	pH	7.7	7.9
	O2 ppm	9.0	9.6
	Cond.	620	600
	Temp(C)	20.0	20.0
Control	pH	8.0	7.9
	O2 ppm	9.0	9.4
	Cond.	640	650
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890041

TEST CONDITIONS

Company : Esso Petroleum Canada
Sarnia, ONT
(70102)
Region : Southwest
Industry : Petroleum Refining

Control point : CW-Sep.3, (600)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C.Ferguson
Date Collected : 05/23/89
Received : 05/23/89
Tested : 05/23/89 at: 1510

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	48:00	%
100	0	0	0
50	0	0	0
26	0	3	25
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890041

TEST CONC.		ELAPSED TIME 00:00	48:00
%			
100	pH	7.8	7.6
	O2 ppm	9.4	8.8
	Cond.	188	202
	Temp(C)	20.0	20.0
50	pH	7.9	7.8
	O2 ppm	9.2	8.8
	Cond.	388	355
	Temp(C)	20.0	20.0
26	pH	8.0	7.9
	O2 ppm	9.0	9.4
	Cond.	406	425
	Temp(C)	20.0	20.0
13	pH	8.0	7.9
	O2 ppm	9.2	9.4
	Cond.	440	462
	Temp(C)	20.0	20.0
6	pH	8.0	7.9
	O2 ppm	9.1	9.4
	Cond.	452	480
	Temp(C)	20.0	20.0
Control	pH	7.9	7.9
	O2 ppm	9.4	9.4
	Cond.	478	488
	Temp(C)	20.0	20.0

COMPANY: Petro-Canada Inc., Mississauga (130104)
(now with Clarkson Refinery)
SECTOR: Petroleum Refining
REGION: Central

SUMMARY
The data for six trout bioassays, conducted on process effluent samples collected between December 1988 and May 1989, were provided by Petro-Canada Incorporated. All six process effluent samples were determined to have been non-acutely lethal to test fish. Trout bioassays conducted on cooling water samples collected in February and May 1989 indicate the samples were not acutely lethal. Bioassay data for one intake water sample collected in February indicate the sample was not acutely lethal to test fish.

Process Effluent

06881219 sampled: 12/13/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or sublethal impairment observed

06890113 sampled: 01/17/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: 10 % mortality in full strength effluent

06890207 sampled: 02/07/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or sublethal impairment observed

06890334 sampled: 03/21/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mort. or sublethal impairment observed

06890422 sampled: 04/11/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or sublethal impairment observed

06890508 sampled: 05/02/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or sublethal impairment observed

storm water

cooling water-trap 1

06890223 sampled: 02/27/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or sublethal impairment observed

06890523 sampled: 05/09/89 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 40 % mort. in full strength effluent

cooling water-trap 3

06890224 sampled: 02/27/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or sublethal impairment observed

06890525 sampled: 05/09/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or sublethal impairment observed

intake water

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 06881219

TEST CONDITIONS

Company	: Petro-Canada Inc. Mississauga, ONT (130104)
Region	: Central
Industry	: Petroleum Refining
Control point	: Process Effluent, (100)
Laboratory	: Beak
Sampling Method	: grab
Sampled By	: Tom Tubello
Date Collected	: 12/13/88
Received	: 12/13/88
Tested	: 12/13/88 at: 1400
Type of Bioassay	: STATIC (Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).
Test Animal	: Rainbow trout
Weight(gm)	:
Length(mm)	:

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50	: Non-lethal
95% fid. limits	: 0.0 - 0.0 %
Comments	: no mortality or sublethal impairment observed

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06881219

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
100	pH	7.2	8.0	8.0	7.9	8.1
	O2 ppm	8.0	8.8	8.6	8.3	9.2
	Cond.	584				574
	Temp(C)	15.0	15.0	15.0	15.0	15.0
50	pH	7.4	7.7	7.9	7.8	7.9
	O2 ppm	7.4	7.8	7.2	7.4	7.6
	Cond.	455				439
	Temp(C)	15.0	15.0	15.0	15.0	15.0
30	pH	7.5	8.0	8.2	8.1	8.2
	O2 ppm	9.3	8.8	9.4	8.3	8.6
	Cond.	431				418
	Temp(C)	15.0	15.0	15.0	15.0	15.0
20	pH	7.5	8.0	8.3	8.3	8.3
	O2 ppm	9.2	9.6	9.4	9.9	9.9
	Cond.	414				415
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.6	8.0	8.3	8.3	8.3
	O2 ppm	8.8	9.6	9.6	9.7	9.8
	Cond.	405				410
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.9	8.2	8.3	8.1	8.3
	O2 ppm	9.3	10.4	9.4	9.4	9.9
	Cond.	317				336
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 06890113

TEST CONDITIONS

Company	: Petro-Canada Inc. Mississauga, ONT (130104)
Region	: Central
Industry	: Petroleum Refining
Control point	: Process Effluent, (100)
Laboratory	: Beak
Sampling Method	: grab
Sampled By	: Tom Tubello
Date Collected	: 01/17/89
Received	: 01/17/89
Tested	: 01/17/89 at: 1630
Type of Bioassay	: STATIC (Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).
Test Animal	: Rainbow trout
Weight(gm)	:
Length(mm)	:

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	24:00	48:00	72:00	96:00	TOTAL MORTALITY %
100	0	0	0	0	1	10
50	0	0	1	2	3	30
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50	: Non-lethal
95% fid. limits	: 0.0 - 0.0 %
Comments	: 10 % mortality in full strength effluent

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890113

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
100	pH	7.6	7.8	7.9	7.7	7.7
	O2 ppm	7.6	8.0	7.4	7.4	7.9
	Cond.	679				702
	Temp(C)	15.0	15.0	15.0	15.0	15.0
50	pH	7.7	7.8	7.9	7.7	7.7
	O2 ppm	8.2	7.4	7.4	8.1	7.8
	Cond.	533				547
	Temp(C)	15.0	15.0	15.0	15.0	15.0
30	pH	7.8	8.1	8.0	7.9	8.1
	O2 ppm	7.8	8.8	8.0	8.2	8.4
	Cond.	466				474
	Temp(C)	15.0	15.0	15.0	15.0	15.0
20	pH	7.9	8.1	8.1	8.1	8.2
	O2 ppm	8.7	9.4	8.5	9.8	10.4
	Cond.	433				442
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.8	7.8	8.2	8.1	8.1
	O2 ppm	8.9	8.0	9.3	8.8	9.6
	Cond.	399				391
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.9	8.2	8.2	8.1	8.0
	O2 ppm	9.0	9.4	9.8	9.8	9.6
	Cond.	363				357
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 06890207

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : Beak
Sampling Method : grab
Sampled By : Tom Tubello
Date Collected : 02/07/89
Received : 02/07/89
Tested : 02/07/89 at: 1230

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or sublethal impairment observed

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890207

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
100	pH	7.4	8.0	8.1	8.1	8.1
	O2 ppm	8.2	9.4	10.0	10.0	10.0
	Cond.	845				872
	Temp(C)	15.0	14.0	14.0	15.0	16.0
50	pH	7.5	8.1	8.1	8.1	8.2
	O2 ppm	9.5	10.0	10.6	10.2	10.1
	Cond.	607				660
	Temp(C)	15.0	14.0	14.0	15.0	16.0
30	pH	7.5	8.1	8.1	8.1	8.2
	O2 ppm	9.8	10.2	10.4	9.9	9.6
	Cond.	513				566
	Temp(C)	15.0	14.0	14.0	15.0	16.0
20	pH	7.4	7.9	8.1	8.1	8.0
	O2 ppm	9.6	9.0	9.2	9.1	9.0
	Cond.	461				513
	Temp(C)	15.0	14.0	14.0	15.0	16.0
10	pH	7.3	8.0	8.1	8.1	8.0
	O2 ppm	9.8	10.1	9.6	9.4	8.9
	Cond.	407				467
	Temp(C)	15.0	14.0	14.0	15.0	16.0
Control	pH	7.4	7.8	7.9	7.8	8.0
	O2 ppm	9.8	10.0	10.2	9.8	9.7
	Cond.	382				398
	Temp(C)	15.0	14.0	14.0	15.0	16.0

NISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 06890334

TEST CONDITIONS

Company	: Petro-Canada Inc. Mississauge, ONT (130104)
Region	: Central
Industry	: Petroleum Refining
Control point	: Process Effluent, (100)
Laboratory	: Beak
Sampling Method	: grab
Sampled By	: Tom Tubello
Date Collected	: 03/21/89
Received	: 03/21/89
Tested	: 03/22/89 at: 1130
Type of Biossay	: STATIC (Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).
Test Animal	: Rainbow trout
Weight(gm)	:
Length(mm)	:

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	24:00	48:00	72:00	96:00	TOTAL MORTALITY %
100	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mort. or sublethal impairment observed

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890334

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
100	pH	7.3	7.8	8.0	8.3	8.4
	O2 ppm	9.2	9.8	9.5	9.4	9.3
	Cond.	697				642
	Temp(C)	15.0	14.0	15.0	15.0	14.0
50	pH	7.4	7.8	8.0	8.3	8.3
	O2 ppm	9.7	9.9	7.9	8.7	8.7
	Cond.	532				509
	Temp(C)	15.0	14.0	15.0	15.0	14.0
30	pH	7.4	8.0	8.0	8.4	8.5
	O2 ppm	9.6	10.4	8.9	10.0	8.8
	Cond.	468				446
	Temp(C)	15.0	14.0	15.0	15.0	14.0
20	pH	7.4	8.0	8.0	8.3	8.4
	O2 ppm	9.8	9.8	9.4	9.4	8.4
	Cond.	434				417
	Temp(C)	15.0	14.0	15.0	15.0	14.0
10	pH	7.4	7.9	8.0	8.3	8.4
	O2 ppm	9.4	9.3	9.2	8.4	9.5
	Cond.	404				390
	Temp(C)	15.0	14.0	15.0	15.0	14.0
Control	pH	7.3	7.9	7.9	8.3	8.5
	O2 ppm	8.9	8.2	8.2	7.2	8.9
	Cond.	372				351
	Temp(C)	15.0	14.0	15.0	15.0	14.0

NISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 06890422

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : Beak
Sampling Method : grab
Sampled By : Tom Tubello
Date Collected : 04/11/89
Received : 04/11/89
Tested : 04/11/89 at: 1500

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or sublethal impairment observed

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890422

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
100	pH	7.4	7.8	8.0	8.0	7.9
	O2 ppm	8.8	8.0	9.0	9.1	9.0
	Cond.	610				652
	Temp(C)	15.0	14.0	14.0	14.0	15.0
50	pH	7.6	8.1	8.1	8.2	8.1
	O2 ppm	9.9	9.6	9.6	9.8	9.7
	Cond.	504				509
	Temp(C)	15.0	14.0	14.0	14.0	15.0
30	pH	7.5	7.8	7.9	8.2	8.1
	O2 ppm	9.7	8.9	7.2	9.5	9.3
	Cond.	464				461
	Temp(C)	15.0	14.0	14.0	14.0	15.0
20	pH	7.5	7.9	8.0	7.7	8.1
	O2 ppm	9.4	8.9	8.0	8.8	8.4
	Cond.	439				428
	Temp(C)	15.0	14.0	14.0	14.0	15.0
10	pH	7.4	7.8	7.8	7.4	8.1
	O2 ppm	8.9	8.1	8.2	7.4	8.0
	Cond.	405				393
	Temp(C)	15.0	14.0	14.0	14.0	15.0
Control	pH	7.9	7.8	7.8	8.0	7.9
	O2 ppm	9.2	8.0	8.6	8.8	8.6
	Cond.	379				371
	Temp(C)	15.0	14.0	14.0	14.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 06890508

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : Beak
Sampling Method : grab
Sampled By : Karen Gregory
Date Collected : 05/02/89
Received : 05/02/89
Tested : 05/03/89 at: 1200

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
65	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or sublethal impairment observed

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890508

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
100	pH	7.4	8.1	8.1	8.1	8.1
	O2 ppm	6.8	10.0	9.5	8.7	9.0
	Cond.	596				591
	Temp(C)	15.0	15.0	14.0	15.0	15.0
65	pH	7.6	8.1	8.1	8.1	8.1
	O2 ppm	7.4	9.1	9.6	8.8	9.0
	Cond.	509				511
	Temp(C)	15.0	15.0	14.0	15.0	15.0
50	pH	7.6	8.1	8.1	8.1	8.1
	O2 ppm	7.8	9.0	9.7	8.3	9.0
	Cond.	474				472
	Temp(C)	15.0	15.0	14.0	15.0	15.0
30	pH	7.6	8.1	8.2	8.2	8.2
	O2 ppm	7.4	9.6	9.8	9.3	9.1
	Cond.	425				424
	Temp(C)	15.0	15.0	14.0	15.0	15.0
20	pH	7.6	8.0	8.2	8.2	8.2
	O2 ppm	8.6	8.8	10.3	9.9	9.1
	Cond.	404				402
	Temp(C)	15.0	15 0	14.0	15.0	15.0
10	pH	7.7	8.2	8.1	8.3	7.7
	O2 ppm	9.6	9.2	9.3	9.5	8.8
	Cond.	383				373
	Temp(C)	15.0	15.0	14.0	15.0	15.0
Control	pH	7.6	7.9	7.8	8.3	8.0
	O2 ppm	9.4	9.4	8.2	9.5	9.2
	Cond.	358				349
	Temp(C)	15.0	15.0	14.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 06890223

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : cooling water-trap 1, (300)

Laboratory : Beak
Sampling Method : grab
Sampled By : Tom Tubello
Date Collected : 02/27/89
Received : 02/27/89
Tested : 02/27/89 at: 1500

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or sublethal impairment observed

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890223

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
100	pH	8.1	7.9	8.2	8.1	8.1
	O2 ppm	11.4	10.0	10.6	10.3	10.0
	Cond.	346				389
	Temp(C)	15.0	14.0	14.0	15.0	15.0
50	pH	7.9	7.9	8.0	8.1	8.1
	O2 ppm	10.6	8.8	9.2	9.4	9.7
	Cond.	374				393
	Temp(C)	15.0	14.0	14.0	15.0	15.0
30	pH	7.9	8.2	8.1	8.2	8.1
	O2 ppm	10.6	10.6	10.3	10.3	10.4
	Cond.	384				392
	Temp(C)	15.0	14.0	14.0	15.0	15.0
20	pH	7.9	8.1	8.1	8.2	8.1
	O2 ppm	9.9	9.4	9.3	9.4	9.6
	Cond.	388				391
	Temp(C)	15.0	14.0	14.0	15.0	15.0
10	pH	7.9	7.8	8.1	8.2	8.1
	O2 ppm	9.3	8.9	10.0	8.5	9.2
	Cond.	380				377
	Temp(C)	15.0	14.0	14.0	15.0	15.0
Control	pH	7.7	7.8	7.9	8.0	7.8
	O2 ppm	9.8	10.4	10.4	9.6	10.0
	Cond.	397				379
	Temp(C)	15.0	14.0	14.0	15.0	15.0

NISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 06890523

TEST CONDITIONS

Company	: Petro-Canada Inc. Mississauga, ONT (130104)
Region	: Central
Industry	: Petroleum Refining
Control point	: cooling water-trap 1, (300)
Laboratory	: Beak
Sampling Method	: grab
Sampled By	: Karen Gregory
Date Collected	: 05/09/89
Received	: 05/09/89
Tested	: 05/09/89 at: 1600
Type of Bioassay	: STATIC (Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).
Test Animal	: Rainbow trout
Weight(gm)	:
Length(mm)	:

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	1	2	2	4	40
65	0	0	0	0	0	0
50	0	0	1	1	1	10
30	0	0	0	1	1	10
20	0	1	1	2	2	20
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : >100%

95% fid. limits : 0.0 - 0.0 %

Comments : 40 % mort. in full strength effluent

SLOPE of Mortality Curve :
LC50 Calculated By : probit

TOXICITY TEST PARAMETERS

Sample Number: 06890523

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
100	pH	8.2	8.2	8.3	8.2	8.2
	O2 ppm	10.4	10.2	9.0	9.0	9.0
	Cond.	344				344
	Temp(C)	15.0	15.0	15.0	15.0	15.0
65	pH	8.0	8.2	8.2	8.2	8.2
	O2 ppm	9.2	8.7	8.2	8.6	8.0
	Cond.	346				347
	Temp(C)	15.0	15.0	15.0	15.0	15.0
50	pH	7.9	8.2	8.3	8.2	8.2
	O2 ppm	9.0	9.7	8.2	8.9	8.5
	Cond.	346				352
	Temp(C)	15.0	15.0	15.0	15.0	15.0
30	pH	7.8	8.2	8.3	8.2	8.1
	O2 ppm	9.3	8.7	9.3	8.5	8.7
	Cond.	348				353
	Temp(C)	15.0	15.0	15.0	15.0	15.0
20	pH	7.8	8.2	8.2	8.3	8.1
	O2 ppm	9.3	9.0	8.3	8.3	7.9
	Cond.	348				357
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.8	8.2	8.2	8.1	8.0
	O2 ppm	9.3	9.0	7.0	7.6	6.5
	Cond.	350				363
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.7	8.2	8.3	8.2	8.2
	O2 ppm	9.8	8.3	8.8	8.3	8.5
	Cond.	352				374
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 06890224

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : cooling water-trap 3, (500)

Laboratory : Beak
Sampling Method : grab
Sampled By : Tom Tubello
Date Collected : 02/27/89
Received : 02/27/89
Tested : 02/27/89 at: 1530

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or sublethal impairment observed

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890224

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
100	pH	9.0	8.5	8.0	8.2	8.1
	O2 ppm	12.0	8.8	10.0	10.6	10.3
	Cond.	437				493
	Temp(C)	15.0	14.0	14.0	15.0	15.0
50	pH	8.5	8.1	8.1	8.1	8.0
	O2 ppm	10.4	10.4	10.6	10.7	10.4
	Cond.	420				440
	Temp(C)	15.0	14.0	14.0	15.0	15.0
30	pH	8.2	7.9	8.0	8.1	7.9
	O2 ppm	10.2	9.5	9.4	9.5	9.1
	Cond.	413				420
	Temp(C)	15.0	14.0	14.0	15.0	15.0
20	pH	8.0	7.9	8.0	8.1	8.0
	O2 ppm	10.6	10.5	10.2	9.7	9.1
	Cond.	410				405
	Temp(C)	15.0	14.0	14.0	15.0	15.0
10	pH	7.9	7.8	7.9	8.0	7.9
	O2 ppm	9.4	9.0	8.5	8.8	8.1
	Cond.	405				395
	Temp(C)	15.0	14.0	14.0	15.0	15.0
Control	pH	7.7	7.8	7.9	8.0	7.8
	O2 ppm	9.8	10.2	10.4	9.6	10.0
	Cond.	397				379
	Temp(C)	15.0	14.0	14.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 06890525

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : cooling water-trap 3, (500)

Laboratory : Beak
Sampling Method : grab
Sampled By : Karen Gregory
Date Collected : 05/09/89
Received : 05/09/89
Tested : 05/09/89 at: 1630

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
65	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or sublethal impairment observed

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890525

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
100	pH	8.7	8.5	8.3	8.3	8.2
	O2 ppm	9.7	8.1	9.0	8.8	8.4
	Cond.	400				406
	Temp(C)	15.0	15.0	15.0	15.0	15.0
65	pH	8.4	8.1	8.2	8.2	8.2
	O2 ppm	9.2	8.2	8.8	8.3	8.7
	Cond.	381				396
	Temp(C)	15.0	15.0	15.0	15.0	15.0
50	pH	8.1	8.2	8.2	8.1	8.1
	O2 ppm	9.8	8.3	8.0	8.2	8.2
	Cond.	374				393
	Temp(C)	15.0	15.0	15.0	15.0	15.0
30	pH	8.0	8.1	8.1	8.0	8.0
	O2 ppm	8.7	8.5	8.0	9.0	7.3
	Cond.	364				373
	Temp(C)	15.0	15.0	15.0	15.0	15.0
20	pH	7.8	8.1	8.2	8.1	8.1
	O2 ppm	8.7	8.2	8.2	7.9	7.8
	Cond.	359				374
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.8	8.1	8.2	8.1	8.1
	O2 ppm	10.0	8.3	7.9	8.2	8.5
	Cond.	351				377
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.7	8.2	8.3	8.2	8.2
	O2 ppm	9.8	8.3	8.8	8.3	8.5
	Cond.	352				374
	Temp(C)	15.0	15.0	15.0	15.0	15.0

COMPANY: Petro-Canada Inc., Mississauga
(130104)
(now with Clarkson Refinery)
SECTOR: Petroleum Refining
REGION: Central

SUMMARY

Results of eleven Daphnia magna acute lethality toxicity tests conducted on samples collected between December 1988 and May 1989 were submitted by Petro-Canada Inc. in Mississauga. Five of the six Process Effluent samples were not acutely lethal to Daphnia. The sample collected in January was toxic to Daphnia with a 48 h LC50 value of 28.2% effluent.

One sample of Intake Water and two samples from each of Cooling Water Trap 1 and Cooling Water Trap 3 were all not acutely lethal to Daphnia.

Process Effluent

06881224 sampled: 12/13/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: 20 % mortality in full strength effluent

06890116 sampled: 01/17/89 LC50: 28.2 %
95% fid. limits: 20.4 - 38.8 %
comments:

06890208 sampled: 02/07/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no immobility observed during testing

06890332 sampled: 03/21/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or immobility observed in 48 Hrs

06890423 sampled: 04/11/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or immobility observed

06890509 sampled: 05/02/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or immobility observed in 48 Hrs

storm water

cooling water-trap 1

06890225 sampled: 02/27/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: 5 % circling at the end of exposure

06890524 sampled: 05/09/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or immobility observed in 48 Hrs

cooling water-trap 3

06890226 sampled: 02/27/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: 70 % of Daphnia floating at the end of expos.

06890526 sampled: 05/09/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or immobility observed in 48 Hrs

intake water

06890209 sampled: 02/07/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no immobility observed during testing

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 06881224

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : BEAK
Sampling Method : grab
Sampled By : Tom Tubello
Date Collected : 12/13/88
Received : 12/13/88
Tested : 12/14/88 at: 1100

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	2	20
50	0	0	0	0
30	0	0	2	20
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : 20 % mortality in full strength effluent

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 06881224

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
100	pH	7.2		7.5
	O2 ppm	5.6		4.1
	Cond.	582		627
	Temp(C)	20.0	20.0	20.0
50	pH	7.6		7.8
	O2 ppm	6.3		5.4
	Cond.	547		506
	Temp(C)	20.0	20.0	20.0
30	pH	7.7		7.9
	O2 ppm	6.3		6.2
	Cond.	421		456
	Temp(C)	20.0	20.0	20.0
20	pH	7.8		8.0
	O2 ppm	5.8		5.8
	Cond.	391		427
	Temp(C)	20.0	20.0	20.0
10	pH	8.0		8.0
	O2 ppm	6.6		5.5
	Cond.	374		429
	Temp(C)	20.0	20.0	20.0
Control	pH	8.2		7.6
	O2 ppm	6.9		6.5
	Cond.	339		335
	Temp(C)	20.0	20.0	20.0

NISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 06890116

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : Beak
Sampling Method : grab
Sampled By : Tom Tubello
Date Collected : 01/17/89
Received : 01/17/89
Tested : 01/17/89 at: 1500

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	2	10	100
50	0	1	9	90
30	0	0	3	30
20	0	0	4	40
10	0	0	1	10
Control	0	0	0	0

48 Hour LC50 : 28.2 %

95% fid. limits : 20.4 - 38.8 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890116

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
100	pH	7.3		7.9
	O2 ppm	9.1		8.3
	Cond.	709		735
	Temp(C)	20.0	20.0	20.0
50	pH	7.6		8.1
	O2 ppm	9.1		8.5
	Cond.	552		583
	Temp(C)	20.0	20.0	20.0
30	pH	7.8		8.1
	O2 ppm	9.2		8.4
	Cond.	493		518
	Temp(C)	20.0	20.0	20.0
20	pH	7.9		8.1
	O2 ppm	9.2		8.4
	Cond.	451		486
	Temp(C)	20.0	20.0	20.0
10	pH	8.0		8.2
	O2 ppm	9.3		8.6
	Cond.	419		450
	Temp(C)	20.0	20.0	20.0
Control	pH	8.1		8.2
	O2 ppm	9.2		8.7
	Cond.	385		432
	Temp(C)	20.0	20.0	20.0

NISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 06890208

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : Reak
Sampling Method : grab
Sampled By : Tom Tubello
Date Collected : 02/07/89
Received : 02/07/89
Tested : 02/07/89 at: 1430

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no immobility observed during testing

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890208

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
100	pH	7.3		8.1
	O2 ppm	7.4		8.0
	Cond.	660		740
	Temp(C)	20.0	20.0	20.0
50	pH	7.7		8.1
	O2 ppm	8.1		8.0
	Cond.	500		556
	Temp(C)	20.0	20.0	20.0
30	pH	8.0		8.1
	O2 ppm	8.2		8.0
	Cond.	390		436
	Temp(C)	20.0	20.0	20.0
20	pH	8.1		8.2
	O2 ppm	8.1		8.1
	Cond.	375		421
	Temp(C)	20.0	20.0	20.0
10	pH	8.1		8.2
	O2 ppm	8.6		8.6
	Cond.	350		350
	Temp(C)	20.0	20.0	20.0
Control	pH	8.0		8.1
	O2 ppm	8.6		8.4
	Cond.	325		344
	Temp(C)	20.0	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 06890332

TEST CONDITIONS

Company	: Petro-Canada Inc. Mississauga, ONT (130104)
Region	: Central
Industry	: Petroleum Refining
Control point	: Process Effluent, (100)
Laboratory	: Beak
Sampling Method	: grab
Sampled By	: Tom Tubello
Date Collected	: 03/21/89
Received	: 03/21/89
Tested	: 03/21/89 at: 1730
Type of Bioassay	: STATIC (Daphnia magna Acûte Lethality Toxicity Test Protocol. OME, 1988)
Test Animal	: D. magna
Weight(gm)	:
Length(mm)	:

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or immobility observed in 48 Hrs

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890332

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
100	pH	7.3		8.0
	O2 ppm	8.8		8.3
	Cond.	712		708
	Temp(C)	20.0	20.0	20.0
50	pH	7.6		8.1
	O2 ppm	8.9		8.4
	Cond.	570		556
	Temp(C)	20.0	20.0	20.0
30	pH	7.9		8.1
	O2 ppm	9.0		8.4
	Cond.	512		494
	Temp(C)	20.0	20.0	20.0
20	pH	8.0		8.1
	O2 ppm	8.8		8.4
	Cond.	479		456
	Temp(C)	20.0	20.0	20.0
10	pH	8.1		8.2
	O2 ppm	8.9		8.5
	Cond.	448		419
	Temp(C)	20.0	20.0	20.0
Control	pH	8.2		8.2
	O2 ppm	8.9		8.3
	Cond.	418		402
	Temp(C)	20.0	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 06890423

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : Beak
Sampling Method : grab
Sampled By : Tom Tubello
Date Collected : 04/11/89
Received : 04/11/89
Tested : 04/11/89 at: 1600

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or immobility observed

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890423

TEST CONC.		ELAPSED TIME		
%		00:00	24:00	48:00
100	pH	7.3		8.1
	O2 ppm	8.8		7.0
	Cond.	685		686
	Temp(C)	20.0	20.0	20.0
50	pH	7.7		8.1
	O2 ppm	9.0		8.0
	Cond.	535		532
	Temp(C)	20.0	20.0	20.0
30	pH	7.9		8.2
	O2 ppm	9.0		8.2
	Cond.	472		478
	Temp(C)	20.0	20.0	20.0
20	pH	8.0		8.2
	O2 ppm	9.0		8.3
	Cond.	442		448
	Temp(C)	20.0	20.0	20.0
10	pH	8.1		8.3
	O2 ppm	9.1		8.5
	Cond.	412		422
	Temp(C)	20.0	20.0	20.0
Control	pH	8.2		8.2
	O2 ppm	9.0		8.4
	Cond.	382		391
	Temp(C)	20.0	20.0	20.0

NISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 06890509

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : Beak
Sampling Method : grab
Sampled By : Karen Gregory
Date Collected : 05/02/89
Received : 05/02/89
Tested : 05/02/89 at: 1305

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	24:00	48:00	TOTAL MORTALITY %
100	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or immobility observed in 48 Hrs

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890509

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
100	pH	7.4		8.0
	O2 ppm	8.5		8.3
	Cond.	590		629
	Temp(C)	20.0	20.0	21.0
50	pH	7.8		8.1
	O2 ppm	8.8		8.4
	Cond.	468		502
	Temp(C)	20.0	20.0	21.0
30	pH	8.0		8.2
	O2 ppm	8.9		8.5
	Cond.	418		453
	Temp(C)	20.0	20.0	21.0
20	pH	8.1		8.2
	O2 ppm	8.9		8.5
	Cond.	394		424
	Temp(C)	20.0	20.0	21.0
10	pH	8.2		8.2
	O2 ppm	8.9		8.6
	Cond.	367		396
	Temp(C)	20.0	20.0	21.0
Control	pH	8.2		8.2
	O2 ppm	8.9		8.6
	Cond.	343		367
	Temp(C)	20.0	20.0	21.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 06890225

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : cooling water-trap 1, (300)

Laboratory : Beak
Sampling Method : grab
Sampled By : Tom Tubello
Date Collected : 02/27/89
Received : 02/27/89
Tested : 02/28/89 at: 1130

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : 5 % circling at the end of exposure

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890225

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
100	pH	8.1		8.0
	O2 ppm	9.0		8.6
	Cond.	350		371
	Temp(C)	20.0	20.0	21.0
50	pH	7.9		8.0
	O2 ppm	9.4		8.7
	Cond.	350		371
	Temp(C)	20.0	20.0	21.0
30	pH	7.9		8.0
	O2 ppm	9.5		8.9
	Cond.	350		373
	Temp(C)	20.0	20.0	21.0
20	pH	7.9		8.0
	O2 ppm	9.5		8.5
	Cond.	352		374
	Temp(C)	20.0	20.0	21.0
10	pH	7.9		8.0
	O2 ppm	9.6		8.7
	Cond.	353		376
	Temp(C)	20.0	20.0	21.0
Control	pH	7.9		7.7
	O2 ppm	9.8		8.9
	Cond.	359		355
	Temp(C)	20.0	20.0	21.0

NISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 06890524

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : cooling water-trap 1, (300)

Laboratory : Beak
Sampling Method : grab
Sampled By : Karen Gregory
Date Collected : 05/09/89
Received : 05/09/89
Tested : 05/09/89 at: 1400

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	24:00	48:00	TOTAL MORTALITY %
100	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or immobility observed in 48 Hrs

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890524

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
100	pH	8.4		8.0
	O2 ppm	10.2		8.4
	Cond.	331		314
	Temp(C)	20.0	20.0	20.0
50	pH	8.4		8.3
	O2 ppm	9.8		8.3
	Cond.	327		309
	Temp(C)	20.0	20.0	20.0
30	pH	8.4		8.3
	O2 ppm	9.2		8.4
	Cond.	342		311
	Temp(C)	20.0	20.0	20.0
20	pH	8.4		8.3
	O2 ppm	8.3		8.2
	Cond.	365		322
	Temp(C)	20.0	20.0	20.0
10	pH	8.4		8.2
	O2 ppm	8.7		8.1
	Cond.	339		311
	Temp(C)	20.0	20.0	20.0
Control	pH	8.4		8.1
	O2 ppm	8.8		8.0
	Cond.	323		304
	Temp(C)	20.0	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 06890226

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : cooling water-trap 3, (500)

Laboratory : Beak
Sampling Method : grab
Sampled By : Tom Tubello
Date Collected : 02/27/89
Received : 02/27/89
Tested : 02/28/89 at: 1300

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - [illegible]0 %

Comments : 70 % of Daphnia floating at the end of expos.

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890226

TEST CONC. %		ELAPSED TIME 00:00	24:[illegible]:00	
100	pH	8.3		8.0
	O2 ppm	8.6		8.5
	Cond.	459		474
	Temp(C)	20.0	20.0	21.0
50	pH	8.1		8.0
	O2 ppm	9.3		8.9
	Cond.	403		426
	Temp(C)	20.0	20.0	21.0
30	pH	8.0		8.0
	O2 ppm	9.5		8.6
	Cond.	382		403
	Temp(C)	20.0	20.0	21.0
20	pH	7.9		7.9
	O2 ppm	9.5		9.0
	Cond.	373		392
	Temp(C)	20.0	20.0	21.0
10	pH	7.9		7.7
	O2 ppm	9.5		9.0
	Cond.	374		379
	Temp(C)	20.0	20.0	21.0
Control	pH	7.9		7.7
	O2 ppm	9.7		8.9
	Cond.	356		355
	Temp(C)	20.0	20.0	21.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 06890526

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : cooling water-trap 3, (500)

Laboratory : Beak
Sampling Method : grab
Sampled By : Karen Gregory
Date Collected : 05/09/89
Received : 05/09/89
Tested : 05/09/89 at: 1100

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	24:00	48:00	TOTAL MORTALITY %
100	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or immobility observed in 48 Hrs

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890526

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
100	pH	8.7		8.1
	O2 ppm	9.2		8.5
	Cond.	366		366
	Temp(C)	20.0	20.0	20.0
50	pH	8.6		8.0
	O2 ppm	8.6		8.4
	Cond.	347		339
	Temp(C)	20.0	20.0	20.0
30	pH	8.5		8.0
	O2 ppm	8.6		8.3
	Cond.	337		328
	Temp(C)	20.0	20.0	20.0
20	pH	8.4		8.0
	O2 ppm	8.6		8.3
	Cond.	331		324
	Temp(C)	20.0	20.0	20.0
10	pH	8.4		8.0
	O2 ppm	8.5		8.3
	Cond.	326		319
	Temp(C)	20.0	20.0	20.0
Control	pH	8.3		8.0
	O2 ppm	9.0		8.2
	Cond.	319		310
	Temp(C)	20.0	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 06890209

TEST CONDITIONS

Company : Petro-Canada Inc.
Mississauga, ONT
(130104)
Region : Central
Industry : Petroleum Refining

Control point : intake water, (600)

Laboratory : Beak
Sampling Method : grab
Sampled By : Tom Tubello
Date Collected : 02/07/89
Received : 02/07/89
Tested : 02/07/89 at: 1445

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no immobility observed during testing

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890209

TEST CONC.		ELAPSED TIME		
%		00:00	24:00	48:00
100	pH	8.0		8.1
	O2 ppm	9.8		7.4
	Cond.	332		334
	Temp(C)	20.0	20.0	20.0
50	pH	8.1		8.1
	O2 ppm	9.7		8.0
	Cond.	340		341
	Temp(C)	20.0	20.0	20.0
30	pH	8.1		8.1
	O2 ppm	9.0		8.2
	Cond.	347		349
	Temp(C)	20.0	20.0	20.0
20	pH	8.1		8.0
	O2 ppm	8.7		8.5
	Cond.	349		350
	Temp(C)	20.0	20.0	20.0
10	pH	8.1		8.0
	O2 ppm	8.7		8.5
	Cond.	353		356
	Temp(C)	20.0	20.0	20.0
Control	pH	8.0		8.0
	O2 ppm	8.6		8.4
	Cond.	351		355
	Temp(C)	20.0	20.0	20.0

COMPANY: Petro-Canada Inc., Oakville
(530006)
(now with Trafalgar Refinery)
SECTOR: Petroleum Refining
REGION: Central

SUMMARY
The data for six trout bioassays, conducted on process effluent samples between December 1988 and May 1989, were provided by Petro-Canada Incorporated. Two of the process effluent samples were determined to have been acutely lethal to the test fish. Statistically, the percentage effluent required to kill 50 % of the test fish by the end of the four days exposure were 76.4 % (December) and 71.0 % (March). The other four samples were determined to have been non-acutely lethal.

Process Effluent

06881223 sampled: 12/13/88 LC50: 76.4 %
95% fid. limits: 74.0 - 78.7 %
comments:

06890112 sampled: 01/17/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

06890217 sampled: 02/21/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

06890335 sampled: 03/21/89 LC50: 71.0 %
95% fid. limits: 50.0 - 100.0 %
comments: fish mort. occured within 24 Hrs of exposure

06890424 sampled: 04/11/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or sublethal impairment observed

01890072 sampled: 05/03/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA audit sample.

06890539 sampled: 05/16/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or sublethal impairment in 96Hrs

Petro-Canada Inc. (continued)

EO-sheet pond

intake water

storm water

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 06881223

TEST CONDITIONS

Company : Petro-Canada Inc.
Oakville, ONT
(530006)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : Beak
Sampling Method : 24hr. Comp
Sampled By : Petro Canada
Date Collected : 12/13/88
Received : 12/13/88
Tested : 12/13/88 at: 1400

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	4	7	9	90
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	1	10
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : 76.4 %

95% fid. limits : 74.0 - 78.7 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : Moving average

TOXICITY TEST PARAMETERS

Sample Number: 06881223

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
100	pH	8.3	8.3	8.3	8.3	8.4
	O2 ppm	8.2	8.6	8.4	7.2	8.6
	Cond.	1820				1877
	Temp(C)	14.0	15.0	15.0	15.0	15.0
50	pH	8.1	8.2	8.4	8.3	8.4
	O2 ppm	8.2	9.2	8.6	8.6	9.2
	Cond.	1165				1138
	Temp(C)	14.0	15.0	15.0	15.0	15.0
30	pH	8.0	8.3	8.4	8.3	8.4
	O2 ppm	9.4	9.6	9.8	9.4	10.0
	Cond.	851				834
	Temp(C)	14.0	15.0	15.0	15.0	15.0
20	pH	7.9	8.2	8.3	8.3	8.3
	O2 ppm	8.4	9.8	9.6	9.9	9.7
	Cond.	677				650
	Temp(C)	14.0	15.0	15.0	15.0	15.0
10	pH	7.7	8.1	8.1	8.0	8.2
	O2 ppm	8.2	8.2	8.2	8.3	8.2
	Cond.	509				480
	Temp(C)	14.0	15.0	15.0	15.0	15.0
Control	pH	7.9	8.2	8.3	8.1	8.3
	O2 ppm	9.3	10.4	9.4	9.4	9.9
	Cond.	317				336
	Temp(C)	15.0	15.0	15.0	15.0	15.0

NISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 06890112

TEST CONDITIONS

Company : Petro-Canada Inc.
Oakville, ONT
(530006)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : Beak
Sampling Method : grab
Sampled By : Tom Tubello
Date Collected : 01/17/89
Received : 01/17/89
Tested : 01/17/89 at: 1600

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
50	0	0	0	0	1	10
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890112

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
100	pH	9.0	8.4	8.4	8.3	8.3
	O2 ppm	8.6	8.8	9.0	9.2	9.2
	Cond.	2110				2120
	Temp(C)	15.0	15.0	15.0	15.0	15.0
50	pH	8.8	8.2	8.3	8.1	8.1
	O2 ppm	8.1	8.6	8.6	7.8	8.8
	Cond.	1269				1307
	Temp(C)	15.0	15.0	15.0	15.0	15.0
30	pH	8.5	8.2	8.2	8.2	8.3
	O2 ppm	8.6	9.4	8.8	8.8	10.0
	Cond.	905				935
	Temp(C)	15.0	15.0	15.0	15.0	15.0
20	pH	8.3	8.1	8.2	8.1	8.2
	O2 ppm	8.2	8.4	9.8	8.6	8.6
	Cond.	731				760
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	8.1	8.1	8.3	8.1	8.2
	O2 ppm	9.3	9.8	9.8	9.6	10.0
	Cond.	547				571
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	8.0	8.2	8.1	8.1	8.0
	O2 ppm	9.0	9.4	9.8	9.8	9.6
	Cond.	363				351
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 06890217

TEST CONDITIONS

Company : Petro-Canada Inc.
Oakville, ONT
(530006)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : Beak
Sampling Method : grab
Sampled By : Steve Mo
Date Collected : 02/21/89
Received : 02/21/89
Tested : 02/21/89 at: 1700

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 06890217

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
100	pH	7.9	8.0	8.1	8.1	8.0
	O2 ppm	7.0	8.6	9.4	9.4	10.4
	Cond.	1887				1785
	Temp(C)	15.0	15.0	14.0	14.0	15.0
50	pH	7.7	8.1	8.1	8.1	8.1
	O2 ppm	8.4	8.9	9.8	9.9	10.8
	Cond.	1182				1087
	Temp(C)	15.0	15.0	14.0	14.0	15.0
30	pH	7.7	7.8	8.1	8.1	8.1
	O2 ppm	8.5	8.8	9.5	10.3	10.8
	Cond.	884				819
	Temp(C)	15.0	15.0	14.0	14.0	15.0
20	pH	7.5	7.9	8.0	8.0	8.1
	O2 ppm	8.8	8.4	9.0	8.8	9.5
	Cond.	720				680
	Temp(C)	15.0	15.0	14.0	14.0	15.0
10	pH	7.3	7.3	8.1	8.1	8.1
	O2 ppm	8.8	7.8	9.8	9.9	10.3
	Cond.	540				531
	Temp(C)	15.0	15.0	14.0	14.0	15.0
Control	pH	7.4	7.8	8.0	7.9	8.0
	O2 ppm	8.2	8.8	8.4	9.0	9.5
	Cond.	399				411
	Temp(C)	15.0	15.0	14.0	14.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 06890335

TEST CONDITIONS

Company : Petro-Canada Inc.
Oakville, ONT
(530006)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : Beak
Sampling Method : grab
Sampled by : Steve Ho
Date Collected : 03/21/89
Received : 03/21/89
Tested : 03/21/89 at: 1500

Type of Biossay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	24:00	48:00	72:00	96:00	TOTAL MORTALITY %
100	0	10	10	10	10	100
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : 71.0 %

95% C.L. limits : 50.0 - 100.0 %

Comments : fish mort. occured within 24 Hrs of exposure

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890335

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
100	pH	8.4	8.1			
	O2 ppm	7.0	10.0			
	Cond.	2110				
	Temp(C)	15.0	14.0			
50	pH	7.9	8.0	8.1	8.3	8.4
	O2 ppm	8.6	10.2	9.0	7.9	9.0
	Cond.	1253				1202
	Temp(C)	15.0	14.0	15.0	15.0	14.0
30	pH	7.7	8.1	8.1	8.2	8.3
	O2 ppm	9.5	10.2	9.2	7.3	9.0
	Cond.	898				855
	Temp(C)	15.0	14.0	15.0	15.0	14.0
20	pH	7.6	7.9	8.0	8.1	8.5
	O2 ppm	9.4	9.3	8.6	7.9	9.7
	Cond.	730				695
	Temp(C)	15.0	14.0	15.0	15.0	14.0
10	pH	7.4	7.9	8.1	8.3	8.4
	O2 ppm	9.2	8.9	8.7	8.8	8.5
	Cond.	539				505
	Temp(C)	15.0	14.0	15.0	15.0	14.0
Control	pH	7.3	7.9	7.9	8.3	8.5
	O2 ppm	8.9	8.2	8.2	7.2	8.9
	Cond.	372				351
	Temp(C)	15.0	14.0	15.0	15.0	14.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 06890424

TEST CONDITIONS

Company	: Petro-Canada Inc. Oakville, ONT (530006)
Region	: Central
Industry	: Petroleum Refining
Control point	: Process Effluent, (100)
Laboratory	: Beak
Sampling Method	: grab
Sampled By	: Steven Ho
Date Collected	: 04/11/89
Received	: 04/11/89
Tested	: 04/11/89 at: 1500
Type of Bioassay	: STATIC (Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).
Test Animal	: Rainbow trout
Weight(gm)	:
Length(mm)	:

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50	: Non-lethal
95% fid. limits	: 0.0 - 0.0 %
Comments	: no mortality or sublethal impairment observed

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890424

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
100	pH	8.4	8.2	8.2	8.3	8.1
	O2 ppm	7.2	8.9	9.1	9.3	9.2
	Cond.	1910				1799
	Temp(C)	15.0	14.0	14.0	14.0	15.0
50	pH	8.1	7.9	7.9	7.9	7.8
	O2 ppm	7.9	7.0	8.1	8.7	8.2
	Cond.	1249				1182
	Temp(C)	15.0	14.0	14.0	14.0	15.0
30	pH	8.0	8.0	8.1	8.1	8.0
	O2 ppm	9.2	8.3	8.6	9.1	9.0
	Cond.	874				862
	Temp(C)	15.0	14.0	14.0	14.0	15.0
20	pH	8.1	8.2	8.3	8.2	8.2
	O2 ppm	10.2	9.6	9.6	9.7	9.4
	Cond.	731				705
	Temp(C)	15.0	14.0	14.0	14.0	15.0
10	pH	7.8	8.1	8.2	8.0	8.1
	O2 ppm	9.6	8.9	8.9	8.8	8.9
	Cond.	564				554
	Temp(C)	15.0	14.0	14.0	14.0	15.0
Control	pH	7.9	7.8	7.8	8.0	7.9
	O2 ppm	9.2	8.0	8.6	8.8	8.6
	Cond.	379				366
	Temp(C)	15.0	14.0	14.0	14.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 01890072

TEST CONDITIONS

Company : Petro-Canada Inc.
Oakville, ONT
(530006)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : MOE
Sampling Method : grab
Sampled By : R. Gibson
Date Collected : 05/03/89
Received : 05/03/89
Tested : 05/04/89 at: 1100

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME									TOTAL MORTALITY
%	00:00	00:30	01:00	02:00	04:00	22:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : MISA audit sample.

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 01890072

TEST CONC. %		ELAPSED TIME 00:00	00:30	01:00	02:00	04:00	22:00	48:00	72:00	96:0
100	pH	8.4	8.1				8.1	8.0	7.9	7.
	O2 ppm	7.0	9.1				9.6	9.6	9.6	9.
	Cond.	1500	1500				1600	1600	1585	155
	Temp(C)	15.0	15.0				15.0	15.0	15.0	15.
65	pH		8.1				8.1	8.0	8.1	8.
	O2 ppm		9.2				9.6	9.7	9.6	9.
	Cond.		1100				1210	1180	1190	117
	Temp(C)		15.0				15.0	15.0	15.0	15.
40	pH		8.0				8.0	8.0	8.0	7.
	O2 ppm		9.0				9.7	9.6	9.7	9.
	Cond.		745				800	775	770	75
	Temp(C)		15.0				15.0	15.0	15.0	15.
30	pH		8.0				7.9	7.8	7.8	7.
	O2 ppm		9.3				9.5	9.6	9.7	9.
	Cond.		640				640	620	625	61
	Temp(C)		15.0				15.0	15.0	15.0	15.
20	pH		8.0				7.9	7.9	7.7	7.
	O2 ppm		9.5				9.6	9.7	9.7	9.
	Cond.		495				540	530	530	51
	Temp(C)		15.0				15.0	15.0	15.0	15.
10	pH		7.7				7.7	7.8	7.8	7.
	O2 ppm		9.5				9.6	9.6	9.6	9.
	Cond.		385				400	400	400	39
	Temp(C)		15.0				15.0	15.0	15.0	15.
Control	pH		7.4				7.4	7.4	7.5	7.
	O2 ppm		9.5				9.7	9.7	9.8	9.
	Cond.		260				265	265	265	26
	Temp(C)		15.0				15.0	15.0	15.0	15.

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 06890539

TEST CONDITIONS

Company	: Petro-Canada Inc. Oakville, ONT (530006)
Region	: Central
Industry	: Petroleum Refining
Control point	: Process Effluent, (100)
Laboratory	: Bask
Sampling Method	: grab
Sampled By	: Steven Ho
Date Collected	: 05/16/89
Received	: 05/16/89
Tested	: 05/16/89 at: 1130
Type of Bioassay	: STATIC (Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).
Test Animal	: Rainbow trout
Weight(gm)	:
Length(mm)	:

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
65	0	0	0	0	0	0
50	0	0	1	1	1	10
30	0	0	0	0	0	0
15	0	0	0	0	0	0
5	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or sublethal impairment in 96Hrs

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890539

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
100	pH	8.1	8.4	2.0	8.2	8.2
	O2 ppm	7.1	9.0	9.1	8.4	8.4
	Cond.	1809				1683
	Temp(C)	14.0	15.0	15.0	15.0	15.0
65	pH	7.9	8.3	8.1	8.2	8.1
	O2 ppm	7.5	9.8	7.9	8.8	9.5
	Cond.	1243				1258
	Temp(C)	14.0	15.0	15.0	15.0	15.0
50	pH	7.9	8.3	8.2	8.2	8.1
	O2 ppm	7.9	9.8	9.7	9.0	8.9
	Cond.	1009				1202
	Temp(C)	14.0	15.0	15.0	15.0	15.0
30	pH	7.8	8.2	8.0	8.1	8.0
	O2 ppm	7.9	9.0	8.4	8.6	9.2
	Cond.	713				677
	Temp(C)	14.0	15.0	15.0	15.0	15.0
15	pH	7.9	8.2	8.1	8.1	7.9
	O2 ppm	8.6	8.4	8.8	9.2	8.3
	Cond.	506				490
	Temp(C)	14.0	15.0	15.0	15.0	15.0
5	pH	7.8	8.3	8.2	8.2	7.8
	O2 ppm	9.5	9.0	8.8	9.0	9.0
	Cond.	382				360
	Temp(C)	14.0	15.0	15.0	15.0	15.0
Control	pH	7.7	8.1	8.2	8.2	7.9
	O2 ppm	9.9	9.6	9.0	9.2	9.1
	Cond.	402				402
	Temp(C)	14.0	15.0	15.0	15.0	15.0

COMPANY: Petro-Canada Inc., Oakville
(530006)
(now with Trafalgar Refinery)
SECTOR: Petroleum Refining
REGION: Central

SUMMARY

Results for six Daphnia magna acute lethality toxicity tests conducted on samples of Process Effluent collected between December 1988 and May 1989 were submitted by Petro-Canada Inc. in Oakville. Three of the six samples were not toxic to Daphnia. Two samples were toxic to Daphnia with 48 h LC50 values of 31% and 41% effluent. One sample was mildly toxic with a 48 h LC50 > 100% effluent.

Process Effluent

06881218 sampled: 12/13/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

06890115 sampled: 01/17/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

06890218 sampled: 02/21/89 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 20 % mortality in undiluted sample

06890333 sampled: 03/21/89 LC50: 41.0 %
95% fid. limits: 34.0 - 49.0 %
comments: most mort. occured within 24 Hrs of exposure

06890425 sampled: 04/11/89 LC50: 31.0 %
95% fid. limits: 27.0 - 36.0 %
comments: 10% Daphnia floating in 20% conc. at 48 Hrs

02890072 sampled: 05/03/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

06890540 sampled: 05/16/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or immobility observed in 48 Hrs

Petro-Canada Inc. (continued)

EO-sheet pond

intake water

storm water

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 06881218

TEST CONDITIONS

Company : Petro-Canada Inc.
Oakville, ONT
(530006)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : BEAK
Sampling Method : 24hr. Comp
Sampled By : Petro-Canada
Date Collected : 12/13/88
Received : 12/13/88
Tested : 12/14/88 at: 1100

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 06881218

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
100	pH	8.2		7.9
	O2 ppm	5.8		3.2
	Cond.	1930		1961
	Temp(C)	20.0	20.0	20.0
50	pH	8.1		8.0
	O2 ppm	6.7		5.5
	Cond.	1068		1203
	Temp(C)	20.0	20.0	20.0
30	pH	8.1		8.1
	O2 ppm	6.2		6.2
	Cond.	815		867
	Temp(C)	20.0	20.0	20.0
20	pH	8.1		8.1
	O2 ppm	6.7		6.3
	Cond.	653		701
	Temp(C)	20.0	20.0	20.0
10	pH	8.0		8.1
	O2 ppm	7.1		6.5
	Cond.	489		517
	Temp(C)	20.0	20.0	20.0
Control	pH	8.2		7.6
	O2 ppm	6.9		6.5
	Cond.	339		355
	Temp(C)	20.0	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 06890115

TEST CONDITIONS

Company : Petro-Canada Inc.
Oakville, ONT
(530006)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory :
Sampling Method : grab
Sampled By : Tom Tubello
Date Collected : 01/17/89
Received : 01/17/89
Tested : 01/17/89 at: 1300

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890115

TEST CONC.		ELAPSED TIME		
%		00:00	24:00	48:00
100	pH	8.5		8.2
	O2 ppm	8.9		7.4
	Cond.	2230		2240
	Temp(C)	20.0	20.0	20.0
50	pH	8.4		8.1
	O2 ppm	9.1		8.0
	Cond.	1285		1328
	Temp(C)	20.0	20.0	20.0
30	pH	8.3		8.1
	O2 ppm	9.2		8.5
	Cond.	932		967
	Temp(C)	20.0	20.0	20.0
20	pH	8.3		8.1
	O2 ppm	9.2		8.4
	Cond.	745		766
	Temp(C)	20.0	20.0	20.0
10	pH	8.2		8.2
	O2 ppm	9.1		8.4
	Cond.	547		565
	Temp(C)	20.0	20.0	20.0
Control	pH	8.2		8.1
	O2 ppm	9.1		8.5
	Cond.	407		432
	Temp(C)	20.0	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 06890218

TEST CONDITIONS

Company : Petro-Canada Inc.
Oakville, ONT
(530006)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : Beak
Sampling Method : grab
Sampled By : Steve Mo
Date Collected : 02/21/89
Received : 02/21/89
Tested : 02/21/89 at: 1500

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	2	20
50	0	0	2	20
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : >100%

95% fid. limits : 0.0 - 0.0 %

Comments : 20 % mortality in undiluted sample

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890218

TEST CONC.		ELAPSED TIME		
%		00:00	24:00	48:00
100	pH	8.0		7.8
	O2 ppm	6.0		6.2
	Cond.	1730		1924
	Temp(C)	20.0	20.0	21.0
50	pH	8.0		7.9
	O2 ppm	8.0		7.5
	Cond.	1086		1163
	Temp(C)	20.0	20.0	21.0
30	pH	7.9		8.0
	O2 ppm	8.0		8.1
	Cond.	775		820
	Temp(C)	20.0	20.0	21.0
20	pH	7.9		8.0
	O2 ppm	8.1		8.4
	Cond.	691		723
	Temp(C)	20.0	20.0	21.0
10	pH	8.0		8.0
	O2 ppm	8.1		8.7
	Cond.	544		537
	Temp(C)	20.0	20.0	21.0
Control	pH	8.1		7.9
	O2 ppm	7.7		10.0
	Cond.	371		345
	Temp(C)	20.0	20.0	21.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 06890333

TEST CONDITIONS

Company : Petro-Canada Inc.
Oakville, ONT
(530006)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : Beak
Sampling Method : grab
Sampled By : Steve Mo
Date Collected : 03/21/89
Received : 03/21/89
Tested : 03/21/89 at: 1730

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	24:00	48:00	TOTAL MORTALITY %
100	0	10	10	100
50	0	1	9	90
30	0	0	1	10
20	0	0	1	10
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : 41.0 %

95% fid. limits : 34.0 - 49.0 %

Comments : most mort. occured within 24 Hrs of exposure

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890333

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
100	pH	8.5		7.7
	O2 ppm	6.4		2.0
	Cond.	2210		2450
	Temp(C)	20.0	20.0	21.0
50	pH	8.5		7.8
	O2 ppm	7.8		4.4
	Cond.	1344		1319
	Temp(C)	20.0	20.0	21.0
30	pH	8.4		7.8
	O2 ppm	7.9		6.1
	Cond.	981		977
	Temp(C)	20.0	20.0	21.0
20	pH	8.4		8.0
	O2 ppm	8.3		7.0
	Cond.	804		804
	Temp(C)	20.0	20.0	21.0
10	pH	8.3		8.1
	O2 ppm	8.8		8.1
	Cond.	608		568
	Temp(C)	20.0	20.0	21.0
Control	pH	8.2		8.3
	O2 ppm	8.9		8.8
	Cond.	418		390
	Temp(C)	20.0	20.0	21.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 06890425

TEST CONDITIONS

Company : Petro-Canada Inc.
Oakville, ONT
(530006)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : Beak
Sampling Method : grab
Sampled By : Steven Ho
Date Collected : 04/11/89
Received : 04/11/89
Tested : 04/11/89 at: 1530

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	10	100
50	0	0	10	100
30	0	0	5	50
20	0	0	0	0
10	0	0	0	0
5	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : 31.0 %

95% fid. limits : 27.0 - 36.0 %

Comments : 10% Daphnia floating in 20% conc. at 48 Hrs

SLOPE of Mortality Curve :
LC50 Calculated By : Sperman-Karber

TOXICITY TEST PARAMETERS

Sample Number: 06890425

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
100	pH	8.2		8.1
	O2 ppm	4.5		8.6
	Cond.	2030		1936
	Temp(C)	20.0	20.0	20.0
50	pH	8.2		8.2
	O2 ppm	7.2		8.6
	Cond.	1144		1168
	Temp(C)	20.0	20.0	20.0
30	pH	8.2		8.2
	O2 ppm	8.0		8.6
	Cond.	837		850
	Temp(C)	20.0	20.0	20.0
20	pH	8.2		8.2
	O2 ppm	8.5		8.6
	Cond.	675		699
	Temp(C)	20.0	20.0	20.0
10	pH	8.2		8.3
	O2 ppm	8.9		8.5
	Cond.	533		556
	Temp(C)	20.0	20.0	20.0
5	pH	8.2		8.3
	O2 ppm	9.0		8.7
	Cond.	467		479
	Temp(C)	20.0	20.0	20.0
Control	pH	8.2		8.2
	O2 ppm	9.0		8.4
	Cond.	382		391
	Temp(C)	20.0	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 02890072

TEST CONDITIONS

Company : Petro-Canada Inc.
Oakville, ONT
(530006)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : MOE
Sampling Method : grab
Sampled By : Raeburn-Gibson
Date Collected : 05/03/89
Received : 05/03/89
Tested : 05/04/89 at: 1130

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal :
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	48:00	72:00	%
100	0	0	0	0
60	0	0	0	0
30	0	1	1	8
15	0	0	0	0
5	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : MISA Audit

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 02890072

TEST CONC.		ELAPSED TIME		
%		00:00	48:00	72:00
100	pH	8.2		8.2
	O2 ppm	7.8		7.1
	Cond.	1840		1840
	Temp(C)	20.0	20.0	20.0
60	pH	8.2		8.1
	O2 ppm	8.9		8.0
	Cond.	1223		1230
	Temp(C)	20.0	20.0	20.0
30	pH	8.1		8.0
	O2 ppm	8.9		8.0
	Cond.	780		785
	Temp(C)	20.0	20.0	20.0
15	pH	8.1		8.1
	O2 ppm	8.9		8.1
	Cond.	550		565
	Temp(C)	20.0	20.0	20.0
5	pH	8.0		8.1
	O2 ppm	8.9		7.9
	Cond.	397		401
	Temp(C)	20.0	20.0	20.0
Control	pH	8.0		8.1
	O2 ppm	9.1		8.3
	Cond.	340		330
	Temp(C)	20.0	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 06890540

TEST CONDITIONS

Company : Petro-Canada Inc.
Oakville, ONT
(530006)
Region : Central
Industry : Petroleum Refining

Control point : Process Effluent, (100)

Laboratory : Beak
Sampling Method : grab
Sampled By : Steven Ho
Date Collected : 05/16/89
Received : 05/16/89
Tested : 05/16/89 at: 1400

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or immobility observed in 48 Hrs

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890540

TEST CONC.		ELAPSED TIME		
%		00:00	24:00	48:00
100	pH	8.0		8.1
	O2 ppm	3.7		6.9
	Cond.	2160		2310
	Temp(C)	21.0	21.0	21.0
50	pH	8.1		8.2
	O2 ppm	7.8		8.0
	Cond.	1326		1351
	Temp(C)	21.0	21.0	21.0
30	pH	8.1		8.2
	O2 ppm	7.6		7.9
	Cond.	971		1002
	Temp(C)	21.0	21.0	21.0
20	pH	8.2		8.2
	O2 ppm	8.0		8.0
	Cond.	777		795
	Temp(C)	21.0	21.0	21.0
10	pH	8.2		8.1
	O2 ppm	8.2		7.9
	Cond.	601		606
	Temp(C)	21.0	21.0	21.0
Control	pH	8.2		8.2
	O2 ppm	8.7		8.2
	Cond.	461		425
	Temp(C)	21.0	21.0	21.0

COMPANY: Petrosar Limited, Sarnia
(480004)
(now with Corunna Mfg. Complex)
SECTOR: Petroleum Refining
REGION: Southwest

SUMMARY
The data for six trout bioassays, conducted on process effluent samples collected between December 1988 and May 1989, were provided by Petrosar Limited. All six process effluent samples were determined to have been non-acutely lethal to test fish.

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intake water

Process Effluent

05880002 sampled: 12/12/88 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

05890001 sampled: 01/09/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890011 sampled: 02/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890022 sampled: 03/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890031 sampled: 04/03/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890036 sampled: 05/01/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

storm water

landfarm leachate

emergency overflow

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05880002

TEST CONDITIONS

Company : Petrosar Limited
Sarnia, ONT
(480004)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T. Moran
Date Collected : 12/12/88
Received : 12/12/88
Tested : 12/13/88 at: 1130

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME								TOTAL MORTALITY
%	00:00	02:10	03:10	05:00	22:25	46:25	70:00	95:10	%
100	0	0	0	0	0	0	0	0	0
75	0	0	0	0	1	2	3	3	30
56	0	0	0	0	0	1	1	1	10
25	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0

96 Hour LC50 : >100%

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05880002

TEST CONC. %		ELAPSED TIME 00:00	02:10	03:10	05:00	22:25	46:25	70:00	95:10
100	pH	7.1				7.5	7.5	7.5	7.6
	O2 ppm	10.2				9.6	8.9	8.9	9.8
	Cond.	1600							1700
	Temp(C)	15.0				15.0	15.0	15.0	15.0
75	pH	7.1				7.5	7.6	7.6	7.6
	O2 ppm	10.3				9.5	9.4	10.0	9.8
	Cond.	1325							1400
	Temp(C)	15.0				15.0	15.0	15.0	15.0
56	pH	7.1				7.5	7.6	7.6	7.6
	O2 ppm	10.4				9.4	9.6	10.1	9.8
	Cond.	1000							1050
	Temp(C)	15.0				15.0	15.0	15.0	15.0
25	pH	7.1				7.5	7.6	7.6	7.7
	O2 ppm	10.4				9.4	9.8	10.1	9.8
	Cond.	550							590
	Temp(C)	15.0				15.0	15.0	15.0	15.0
10	pH	7.1				7.5	7.7	7.7	7.7
	O2 ppm	10.3				9.3	9.7	10.1	10.1
	Cond.	312							320
	Temp(C)	15.0				15.0	15.0	15.0	15.0
1	pH	7.2				7.4	7.7	7.6	7.7
	O2 ppm	10.4				9.4	9.8	10.1	10.0
	Cond.	180							182
	Temp(C)	15.0				15.0	15.0	15.0	15.0
Control	pH	7.0				7.6	7.7	7.6	7.6
	O2 ppm	10.2				10.0	10.0	10.1	10.2
	Cond.	162							168
	Temp(C)	15.0				15.0	15.0	15.0	15.0
Control	pH	7.1				7.6	7.6	7.6	7.6
	O2 ppm	10.3				9.9	10.1	10.2	10.1
	Cond.	162							168
	Temp(C)	15.0				15.0	15.0	15.0	15.0

NISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890001

TEST CONDITIONS

Company : Petrosar Limited
Sarnia, ONT
(480004)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T.Moran
Date Collected : 01/09/89
Received : 01/09/89
Tested : 01/12/89 at: 1130

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	23:00	47:10	71:10	96:10	TOTAL MORTALITY %
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890001

TEST CONC. %		ELAPSED TIME 00:00	23:00	47:10	71:10	96:10
100	pH	7.3	7.6	7.6	7.6	7.6
	O2 ppm	9.4	9.5	10.4	9.9	9.8
	Cond.	1990				1960
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.5	7.6	7.6	7.6	7.6
	O2 ppm	9.3	9.5	10.3	10.0	9.8
	Cond.	1450				1420
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.5	7.7	7.6	7.6	7.7
	O2 ppm	9.6	9.8	10.2	10.2	10.0
	Cond.	1220				1200
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.7	7.7	7.7	7.7	7.7
	O2 ppm	10.4	10.0	10.2	10.2	10.0
	Cond.	680				600
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.7	7.7	7.7	7.7	7.8
	O2 ppm	10.4	10.3	10.2	10.1	10.2
	Cond.	350				374
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.7	7.7	7.7	7.9	7.9
	O2 ppm	10.4	10.4	10.2	10.2	10.2
	Cond.	185				188
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.7	7.6	7.6	7.7	7.7
	O2 ppm	10.4	10.3	10.2	10.0	10.0
	Cond.	165				164
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.8	7.7	7.7	7.8	7.7
	O2 ppm	10.6	10.2	10.1	9.9	10.2
	Cond.	165				164
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890011

TEST CONDITIONS

Company : Petrosar Limited
Sarnia, ONT
(480004)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 02/06/89
Received : 02/06/89
Tested : 02/07/89 at: 1620

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:10	21:20	45:10	70:20	95:10	TOTAL MORTALITY %
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890011

TEST CONC. %		ELAPSED TIME 00:10	21:20	45:10	70:20	95:10
100	pH	7.1	7.5	7.5	7.5	7.5
	O2 ppm	9.6	9.5	9.8	9.4	9.3
	Cond.	2000				2050
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.2	7.6	7.5	7.5	7.5
	O2 ppm	9.6	9.5	9.4	9.3	9.5
	Cond.	1600				1590
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.3	7.6	7.5	7.5	7.5
	O2 ppm	10.0	9.5	9.4	9.3	9.3
	Cond.	1200				1220
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.4	7.8	7.6	7.6	7.5
	O2 ppm	10.4	9.7	9.6	9.4	9.5
	Cond.	650				650
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.5	7.7	7.5	7.5	7.6
	O2 ppm	10.4	9.5	9.4	9.5	9.5
	Cond.	330				348
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.4	7.9	7.5	7.6	7.6
	O2 ppm	10.4	9.8	9.2	9.8	9.2
	Cond.	180				192
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.7	7.5	7.6	7.6
	O2 ppm	10.8	9.8	9.9	10.0	9.7
	Cond.	162				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.6	7.4	7.5	7.6
	O2 ppm	11.0	9.8	9.8	9.9	9.7
	Cond.	162				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0

NISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890022

TEST CONDITIONS

Company	: Petrosar Limited Sarnia, ONT (480004)
Region	: Southwest
Industry	: Petroleum Refining
Control point	: Process Effluent, (200)
Laboratory	: Pollutech
Sampling Method	: Grab
Sampled By	: C. Ferguson
Date Collected	: 03/06/89
Received	: 03/06/89
Tested	: 03/07/89 at: 1520
Type of Bioassay	: STATIC (Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).
Test Animal	: Rainbow trout
Weight(gm)	:
Length(mm)	:

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	20:10	49:20	68:10	95:10	TOTAL MORTALITY %
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890022

TEST CONC. %		ELAPSED TIME 00:00	20:10	49:20	68:10	95:10
100	pH	7.2	7.2	7.2	7.3	7.3
	O2 ppm	8.4	8.4	8.8	9.8	9.3
	Cond.	2200				2220
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.3	7.1	7.2	7.3	7.4
	O2 ppm	8.9	6.4	9.2	9.8	9.4
	Cond.	1770				1790
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.3	7.4	7.3	7.5	7.6
	O2 ppm	9.2	9.0	9.4	10.0	9.4
	Cond.	900				900
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.5	7.5	7.4	7.6	7.6
	O2 ppm	9.5	9.6	9.2	10.0	9.9
	Cond.	780				800
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.5	7.5	7.3	7.6	7.5
	O2 ppm	9.5	9.4	9.0	9.8	10.2
	Cond.	390				410
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.5	7.6	7.4	7.5	7.5
	O2 ppm	9.7	9.4	9.4	9.8	10.0
	Cond.	189				198
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.5	7.6	7.5	7.7
	O2 ppm	10.0	9.8	10.1	10.2	10.2
	Cond.	168				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.5	7.6	7.6	7.7
	O2 ppm	9.9	9.6	9.8	10.2	10.3
	Cond.	168				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890031

TEST CONDITIONS

Company : Petrosar Limited
Sarnia, ONT
(480004)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 04/03/89
Received : 04/03/89
Tested : 04/04/89 at: 1330

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	19:15	46:10	69:00	95:10	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890031

TEST CONC.		ELAPSED TIME				
%		00:00	19:15	46:10	69:00	95:10
100	pH	7.2	7.4	7.4	7.4	7.6
	O2 ppm	8.3	8.6	9.3	9.1	9.3
	Cond.	1710				1710
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.2	7.6	7.5	7.5	7.6
	O2 ppm	8.4	9.4	9.4	8.9	9.4
	Cond.	1710				1710
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.3	7.6	7.3	7.5
	O2 ppm	10.2	9.2	10.1	9.9	10.0
	Cond.	162				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.4	7.6	7.4	7.5
	O2 ppm	10.2	9.2	10.2	10.0	10.0
	Cond.	162				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890036

TEST CONDITIONS

Company : Petrosar Limited
Sarnia, ONT
(480004)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 05/01/89
Received : 05/01/89
Tested : 05/02/89 at: 1400

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	21:30	47:30	72:30	97:30	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890036

TEST CONC. %		ELAPSED TIME 00:00	21:30	47:30	72:30	97:30
100	pH	7.1	7.1	7.2	7.2	7.1
	O2 ppm	8.8	8.9	8.2	9.3	9.4
	Cond.	2100				2100
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.1	7.1	7.1	7.2	7.1
	O2 ppm	8.8	9.6	8.6	9.2	9.5
	Cond.	2080				2110
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.6	7.6	7.6	7.3
	O2 ppm	10.6	9.8	9.3	9.8	10.0
	Cond.	158				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.6	7.6	7.5	7.0
	O2 ppm	10.4	10.0	9.4	9.9	10.1
	Cond.	158				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0

COMPANY: Petrosar Limited, Sarnia
(480004)
(now with Corunna Mfg. Complex)
SECTOR: Petroleum Refining
REGION: Southwest

SUMMARY

The data for six Daphnia magna toxicity tests conducted on samples of Process Effluent collected between December 1988 and May 1989 were supplied by Petrosar Ltd. in Sarnia. All six samples were not acutely lethal to Daphnia magna.

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intake water

Process Effluent

05880002 sampled: 12/12/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890001 sampled: 01/09/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890011 sampled: 02/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890022 sampled: 03/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890031 sampled: 04/03/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890036 sampled: 05/01/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

storm water

landfarm leachate

emergency overflow

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05880002

TEST CONDITIONS

Company : Petrosar Limited
Sarnia, ONT
(480004)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T.Moran
Date Collected : 12/12/88
Received : 12/12/88
Tested : 12/13/88 at: 1150

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	48:00	%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05880002

TEST CONC. %		ELAPSED TIME 00:00	48:00
100	pH	7.4	7.5
	O2 ppm	9.1	9.1
	Cond.	1820	1820
	Temp(C)	20.0	20.0
50	pH	7.9	7.7
	O2 ppm	9.1	9.0
	Cond.	1060	1200
	Temp(C)	20.0	20.0
26	pH	8.0	8.0
	O2 ppm	9.1	9.0
	Cond.	940	930
	Temp(C)	20.0	20.0
13	pH	8.1	8.1
	O2 ppm	9.1	9.2
	Cond.	780	780
	Temp(C)	20.0	20.0
6	pH	8.1	8.0
	O2 ppm	9.1	9.2
	Cond.	680	690
	Temp(C)	20.0	20.0
Control	pH	8.2	8.1
	O2 ppm	9.0	9.0
	Cond.	600	600
	Temp(C)	20.0	20.0

NISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890001

TEST CONDITIONS

Company : Petrosar Limited
Sarnia, ONT
(480004)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T.Moran
Date Collected : 01/09/89
Received : 01/09/89
Tested : 01/09/89 at: 1400

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	47:30	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	1	8
13	0	0	0
6	0	0	0
Control	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890001

TEST CONC. %		ELAPSED TIME 00:00	47:30
100	pH	7.0	7.5
	O2 ppm	9.5	8.2
	Cond.	2290	2200
	Temp(C)	20.0	20.0
50	pH	7.5	7.8
	O2 ppm	9.5	9.2
	Cond.	1450	1400
	Temp(C)	20.0	20.0
26	pH	8.0	7.9
	O2 ppm	9.4	9.5
	Cond.	1030	1020
	Temp(C)	20.0	20.0
13	pH	8.1	8.1
	O2 ppm	9.5	9.5
	Cond.	800	800
	Temp(C)	20.0	20.0
6	pH	8.1	8.1
	O2 ppm	9.5	9.5
	Cond.	700	700
	Temp(C)	20.0	20.0
Control	pH	8.2	8.0
	O2 ppm	9.4	9.5
	Cond.	590	600
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890011

TEST CONDITIONS

Company : Petrosar Limited
Sarnia, ONT
(480004)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 02/06/89
Received : 02/06/89
Tested : 02/07/89 at: 1520

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 01:20	46:25	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890011

TEST CONC. %		ELAPSED TIME 01:20	46:25
100	pH	7.2	7.5
	O2 ppm	9.2	8.6
	Cond.	2260	2390
	Temp(C)	20.0	20.0
50	pH	7.7	7.8
	O2 ppm	9.2	8.9
	Cond.	1480	1510
	Temp(C)	20.0	20.0
26	pH	7.9	7.9
	O2 ppm	9.0	9.0
	Cond.	1080	1100
	Temp(C)	20.0	20.0
13	pH	7.9	8.0
	O2 ppm	9.0	9.0
	Cond.	880	890
	Temp(C)	20.0	20.0
6	pH	8.0	8.0
	O2 ppm	9.0	9.2
	Cond.	740	750
	Temp(C)	20.0	20.0
Control	pH	8.0	7.9
	O2 ppm	9.2	9.2
	Cond.	620	650
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890022

TEST CONDITIONS

Company	: Petrosar Limited Sarnia, ONT (480004)
Region	: Southwest
Industry	: Petroleum Refining
Control point	: Process Effluent, (200)
Laboratory	: Pollutech
Sampling Method	: Grab
Sampled By	: C. Ferguson
Date Collected	: 03/06/89
Received	: 03/06/89
Tested	: 03/07/89 at: 1130
Type of Bioassay	: STATIC (Daphnia magna Acute Lethality Toxicity Test Protocol. OME, 1988)
Test Animal	: D. magna
Weight(gm)	:
Length(mm)	:

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	48:25	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890022

TEST CONC. %		ELAPSED TIME 00:00	48:25
100	pH	7.3	7.0
	O2 ppm	8.6	5.5
	Cond.	2480	2500
	Temp(C)	20.0	20.0
50	pH	7.8	7.4
	O2 ppm	8.5	7.2
	Cond.	1510	1600
	Temp(C)	20.0	20.0
26	pH	7.9	7.7
	O2 ppm	8.6	8.0
	Cond.	1110	1120
	Temp(C)	20.0	20.0
13	pH	8.0	7.8
	O2 ppm	8.8	8.7
	Cond.	850	900
	Temp(C)	20.0	20.0
6	pH	8.0	7.9
	O2 ppm	8.9	8.8
	Cond.	710	740
	Temp(C)	20.0	20.0
Control	pH	8.1	7.9
	O2 ppm	9.1	9.2
	Cond.	600	610
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890031

TEST CONDITIONS

Company : Petrosar Limited
Sarnia, ONT
(480004)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 04/03/89
Received : 04/03/89
Tested : 04/04/89 at: 1545

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	49:10	%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890031

TEST CONC. %		ELAPSED TIME 00:00	49:10
100	pH	7.3	7.6
	O2 ppm	8.8	8.8
	Cond.	1880	1910
	Temp(C)	20.0	20.0
50	pH	7.6	7.8
	O2 ppm	9.0	8.9
	Cond.	1220	1260
	Temp(C)	20.0	20.0
26	pH	7.8	7.9
	O2 ppm	9.2	9.0
	Cond.	900	920
	Temp(C)	20.0	20.0
13	pH	7.9	7.9
	O2 ppm	9.0	9.2
	Cond.	720	780
	Temp(C)	20.0	20.0
6	pH	7.9	7.9
	O2 ppm	9.2	9.2
	Cond.	620	680
	Temp(C)	20.0	20.0
Control	pH	8.0	7.9
	O2 ppm	9.2	9.2
	Cond.	520	595
	Temp(C)	20.0	20.0

NISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890036

TEST CONDITIONS

Company : Petrosar Limited
Sarnia, ONT
(480004)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 05/01/89
Received : 05/01/89
Tested : 05/03/89 at: 1020

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	48:05	TOTAL MORTALITY %
100	0	1	8
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890036

TEST CONC. %		ELAPSED TIME 00:00	48:05
100	pH	7.3	7.4
	O2 ppm	9.6	7.7
	Cond.	2080	2400
	Temp(C)	20.0	20.0
50	pH	7.8	7.7
	O2 ppm	9.6	7.8
	Cond.	1220	1420
	Temp(C)	20.0	20.0
26	pH	7.9	7.9
	O2 ppm	9.6	8.0
	Cond.	940	1010
	Temp(C)	20.0	20.0
13	pH	8.0	8.0
	O2 ppm	9.6	8.2
	Cond.	700	790
	Temp(C)	20.0	20.0
6	pH	8.0	8.0
	O2 ppm	9.4	8.7
	Cond.	540	620
	Temp(C)	20.0	20.0
Control	pH	8.0	8.1
	O2 ppm	9.8	9.2
	Cond.	490	510
	Temp(C)	20.0	20.0

COMPANY: Shell Canada Products Limited, Sarnia (510107)
(now with Sarnia Mfg.)
SECTOR: Petroleum Refining
REGION: Southwest

SUMMARY
The data for six trout bioassays, conducted on process effluent samples collected between December 1988 and May 1989, were provided by Shell Canada Products Limited. All six process effluent samples were determined to have been non-acutely lethal to test fish. Data for bioassays conducted on three intake water samples collected in December 1988, January and May 1989 indicate they were not acutely lethal. Data for bioassays conducted on cooling water samples collected in January and May 1989 indicate they were not acutely lethal.

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intake water

05880007 sampled: 12/12/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890007 sampled: 01/16/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890037 sampled: 05/08/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Process Effluent

05880006 sampled: 12/12/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890008 sampled: 01/16/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890012 sampled: 02/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890027 sampled: 03/28/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890032 sampled: 04/10/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

01890060 sampled: 04/26/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA audit sample.

05890040 sampled: 05/08/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

SW to Talford creek

CW to Talford Creek

05890004 sampled: 01/16/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890038 sampled: 05/08/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

CW from POW

05890005 sampled: 01/16/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890039 sampled: 05/08/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

EO from storm pond

SW to Baby creek

CW to POW

05890006 sampled: 01/16/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05880007

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : intake water, (100)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T.Moran
Date Collected : 12/12/88
Received : 12/12/88
Tested : 12/13/88 at: 1130

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME								TOTAL MORTALITY
%	00:00	02:10	03:10	05:00	22:10	46:25	70:10	95:10	%
100	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0
Control	7	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05880007

TEST CONC. %		ELAPSED TIME 00:00	02:10	03:10	05:00	22:10	46:25	70:10	95:10
100	pH	7.6				7.7	7.8	7.8	7.8
	O2 ppm	10.2				9.6	10.1		10.0
	Cond.	208							212
	Temp(C)	15.0				15.0	15.0	15.0	15.0
75	pH	7.5				7.7	7.8	7.8	7.8
	O2 ppm	10.1				9.8	10.0		9.9
	Cond.	195							202
	Temp(C)	15.0				15.0	15.0	15.0	15.0
56	pH	7.4				7.8	7.8	7.7	7.7
	O2 ppm	10.0				9.9	9.9		10.0
	Cond.	188							198
	Temp(C)	15.0				15.0	15.0	15.0	15.0
25	pH	7.2				7.7	7.7	7.7	7.7
	O2 ppm	10.1				9.9	10.1		10.0
	Cond.	172							182
	Temp(C)	15.0				15.0	15.0	15.0	15.0
10	pH	7.3				7.7	7.7	7.7	7.7
	O2 ppm	9.9				9.9	10.0		10.0
	Cond.	165							170
	Temp(C)	15.0				15.0	15.0	15.0	15.0
1	pH	7.2				7.7	7.7	7.7	7.7
	O2 ppm	9.8				9.8	9.7		10.0
	Cond.	160							168
	Temp(C)	15.0				15.0	15.0	15.0	15.0
Control	pH	7.0				7.6	7.7	7.6	7.6
	O2 ppm	10.2				10.0	10.0	10.1	10.2
	Cond.	162							168
	Temp(C)	15.0				15.0	15.0	15.0	15.0
Control	pH	7.1				7.6	7.6	7.6	7.6
	O2 ppm	10.3				9.9	10.1	10.2	10.1
	Cond.	162							168
	Temp(C)	15.0				15.0	15.0	15.0	15.0

NISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890007

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : intake water, (100)

Laboratory : Pollutech
Sampling Method : grab
Sampled By : T. Moran
Date Collected : 01/16/89
Received : 01/16/89
Tested : 01/17/89 at: 1230

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	22:10	46:00	70:00	95:10	TOTAL MORTALITY %
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890007

TEST CONC. %		ELAPSED TIME 00:00	22:10	46:00	70:00	95:10
100	pH	7.8	7.7	7.7	7.8	7.8
	O2 ppm	10.8	10.0	9.9	10.2	10.1
	Cond.	212				220
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.8	7.7	7.7	7.8	7.8
	O2 ppm	10.8	9.8	9.8	10.2	10.2
	Cond.	202				210
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.7	7.6	7.7	7.8	7.8
	O2 ppm	10.6	10.1	9.8	10.2	10.2
	Cond.	194				205
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.7	7.7	7.6	7.8	7.7
	O2 ppm	10.4	10.2	9.8	10.0	10.2
	Cond.	182				190
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.7	7.7	7.6	7.7	7.7
	O2 ppm	10.4	9.9	10.0	10.0	10.0
	Cond.	180				185
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.7	7.8	7.7	7.9	7.8
	O2 ppm	10.2	9.9	10.0	10.2	10.2
	Cond.	178				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.7	7.7	7.8	7.7
	O2 ppm	10.4	9.9	9.9	10.0	10.2
	Cond.	170				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.7	7.7	7.8	7.7
	O2 ppm	10.2	10.0	10.0	10.2	10.2
	Cond.	170				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890037

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : intake water, (100)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T.Moran
Date Collected : 05/08/89
Received : 05/08/89
Tested : 05/09/89 at: 1430

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	19:00	44:10	69:15	97:10	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890037

TEST CONC. %		ELAPSED TIME 00:00	19:00	44:10	69:15	97:10
100	pH	7.7	7.5	7.5	7.5	7.6
	O2 ppm	10.8	9.4	9.2	9.4	9.3
	Cond.	214				214
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.4	7.4	7.4	7.4	7.6
	O2 ppm	10.4	9.5	9.6	9.2	9.2
	Cond.	202				201
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.4	7.4	7.5	7.4	7.5
	O2 ppm	10.3	9.5	9.6	9.3	9.0
	Cond.	198				199
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.5	7.5	7.5	7.4	7.5
	O2 ppm	10.0	9.5	9.6	9.2	9.5
	Cond.	182				181
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.5	7.5	7.5	7.5	7.5
	O2 ppm	10.0	9.8	9.4	9.4	9.3
	Cond.	176				175
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.4	7.4	7.6	7.5	7.6
	O2 ppm	10.1	10.0	9.4	9.4	9.4
	Cond.	170				169
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.5	7.2	7.4	7.4
	O2 ppm	10.2	9.8	9.4	9.3	9.4
	Cond.	168				168
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.5	7.3	7.5	7.4
	O2 ppm	10.2	9.7	9.2	9.4	9.6
	Cond.	168				169
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05880006

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T.Moran
Date Collected : 12/12/88
Received : 12/12/88
Tested : 12/13/88 at: 1130

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME							TOTAL MORTALITY
%	00:00	02:10	03:10	05:00	22:25	46:10	70:00	95:10	%
100	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05880006

TEST CONC. %		ELAPSED TIME 00:00	02:10	03:10	05:00	22:25	46:10	70:00	95:10
100	pH	7.3				7.6	7.6	7.6	7.7
	O2 ppm	7.6				8.9	9.2	7.8	9.9
	Cond.	650							695
	Temp(C)	15.0				15.0	15.0	15.0	15.0
75	pH	7.2				7.6	7.6	7.6	7.7
	O2 ppm	7.4				8.8	9.1	9.8	9.9
	Cond.	525							540
	Temp(C)	15.0				15.0	15.0	15.0	15.0
56	pH	7.1				7.5	7.5	7.7	7.7
	O2 ppm	7.8				8.9	9.0	9.8	10.0
	Cond.	430							438
	Temp(C)	15.0				15.0	15.0	15.0	15.0
25	pH	7.0				7.5	7.5	7.7	7.7
	O2 ppm	9.1				9.0	9.1	10.0	10.0
	Cond.	282							290
	Temp(C)	15.0				15.0	15.0	15.0	15.0
10	pH	7.1				7.6	7.7	7.7	7.7
	O2 ppm	9.2				9.5	9.2	10.1	10.1
	Cond.	210							218
	Temp(C)	15.0				15.0	15.0	15.0	15.0
1	pH	7.0				7.5	7.6	7.6	7.7
	O2 ppm	9.9				9.9	9.9	10.0	10.2
	Cond.	170							175
	Temp(C)	15.0				15.0	15.0	15.0	15.0
Control	pH	7.0				7.6	7.7	7.6	7.6
	O2 ppm	10.2				10.0	10.0	10.1	10.2
	Cond.	162							168
	Temp(C)	15.0				15.0	15.0	15.0	15.0
Control	pH	7.1				7.6	7.6	7.6	7.6
	O2 ppm	10.3				9.9	10.1	10.1	10.1
	Cond.	162							168
	Temp(C)	15.0				15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890008

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T.Moran
Date Collected : 01/16/89
Received : 01/16/89
Tested : 01/17/89 at: 1230

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal :
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	22:10	47:10	70:00	95:10	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890008

TEST CONC. %		ELAPSED TIME 00:00	22:10	47:10	70:00	95:10
100	pH	7.4	7.6	7.5	7.8	7.8
	O2 ppm	8.8	10.0	9.9	10.4	10.2
	Cond.	540				550
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.5	7.6	7.7	7.8	7.8
	O2 ppm	9.4	10.0	9.9	10.0	10.0
	Cond.	464				460
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.5	7.5	7.6	7.9	7.8
	O2 ppm	9.6	9.6	9.8	10.6	9.2
	Cond.	388				388
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.6	7.6	7.6	7.8	7.8
	O2 ppm	10.2	10.0	9.4	10.2	9.0
	Cond.	268				270
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.7	7.4	7.5	7.7	7.8
	O2 ppm	10.4	9.0	9.7	9.6	9.3
	Cond.	206				210
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.7	7.6	7.4	7.7	7.7
	O2 ppm	10.4	9.6	9.9	9.8	9.6
	Cond.	178				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.7	7.7	7.8	7.7
	O2 ppm	10.4	9.9	9.9	10.0	10.2
	Cond.	170				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.6	7.7	7.8	7.7
	O2 ppm	10.2	10.0	10.0	10.2	10.2
	Cond.	170				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890012

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 02/06/89
Received : 02/06/89
Tested : 02/07/89 at: 1625

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	21:15	45:05	70:15	95:05	TOTAL MORTALITY %
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890012

TEST CONC. %		ELAPSED TIME 00:00	21:15	45:05	70:15	95:05
100	pH	7.1	7.8	7.7	7.7	7.7
	O2 ppm	7.2	9.5	8.6	8.8	9.7
	Cond.	900				890
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.1	7.6	7.5	7.7	7.7
	O2 ppm	8.4	9.0	8.6	8.8	9.5
	Cond.	700				710
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.2	7.7	7.6	7.8	7.7
	O2 ppm	9.0	9.4	8.6	9.2	9.7
	Cond.	600				590
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.3	7.7	7.5	7.7	7.6
	O2 ppm	10.2	9.3	9.2	9.4	9.6
	Cond.	340				349
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.4	7.9	7.6	7.7	7.7
	O2 ppm	10.6	9.8	9.6	9.4	10.0
	Cond.	230				242
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.3	7.8	7.5	7.6	7.7
	O2 ppm	10.6	9.8	9.4	9.5	10.1
	Cond.	170				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.7	7.5	7.6	7.6
	O2 ppm	10.8	9.8	9.9	10.0	9.7
	Cond.	162				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.6	7.4	7.5	7.6
	O2 ppm	11.0	9.8	9.8	9.9	9.7
	Cond.	162				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890027

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T.Moran
Date Collected : 03/28/89
Received : 03/28/89
Tested : 03/29/89 at: 930

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	25:10	50:20	82:10	10:00	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890027

TEST CONC. %		ELAPSED TIME 00:00	25:10	50:20	82:10 10:00
100	pH	7.1	7.6	7.6	7.6
	O2 ppm	7.7	9.8	9.8	9.8
	Cond.	660			610
	Temp(C)	15.0	15.0	15.0	15.0
100	pH	7.1	7.6	7.7	7.6
	O2 ppm	7.9	9.8	9.7	9.9
	Cond.	655			620
	Temp(C)	15.0	15.0	15.0	15.0
Control	pH	7.4	7.5	7.5	7.5
	O2 ppm	10.6	10.1	10.2	10.1
	Cond.	155			168
	Temp(C)	15.0	15.0	15.0	15.0
Control	pH	7.4	7.6	7.6	7.5
	O2 ppm	10.6	10.3	10.1	10.1
	Cond.	155			168
	Temp(C)	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890032

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 04/10/89
Received : 04/10/89
Tested : 04/11/89 at: 1420

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	19:10	43:20	68:20	96:10	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890032

TEST CONC. %		ELAPSED TIME 00:00	19:10	43:20	68:20	96:10
100	pH	7.2	7.3	7.6	7.7	7.7
	O2 ppm	8.2	8.9	9.8	9.6	9.6
	Cond.	488				479
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.2	7.3	7.6	7.7	7.7
	O2 ppm	8.2	8.8	9.8	9.4	9.6
	Cond.	492				482
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.4	7.4	7.5	7.5	7.4
	O2 ppm	10.2	10.2	10.0	9.8	10.0
	Cond.	164				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.4	7.4	7.5	7.5	7.4
	O2 ppm	10.3	10.1	9.9	9.8	10.1
	Cond.	164				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 01890060

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : MOE
Sampling Method : grab
Sampled By : D. Hamilton
Date Collected : 04/26/89
Received : 04/27/89
Tested : 04/27/89 at: 1500

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME						TOTAL MORTALITY
%	00:00	00:30	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	1	10
65	0	0	0	0	0	1	10
40	0	0	0	0	0	0	0
30	0	0	0	0	0	1	10
20	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : MISA audit sample.

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 01890060

TEST CONC. %		ELAPSED TIME 00:00	00:30	24:00	48:00	72:00	96:00
100	pH	7.5	7.5	8.4	8.1	7.9	8.3
	O2 ppm	8.5	8.5	9.8	9.7	9.8	9.6
	Cond.	665	665	630	650	650	630
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
65	pH		7.8	8.2	8.0	7.9	8.3
	O2 ppm		9.1	9.7	9.8	9.8	9.5
	Cond.		515	500	490	495	500
	Temp(C)		15.0	15.0	15.0	15.0	15.0
40	pH		7.8	8.0	8.0	8.1	8.0
	O2 ppm		9.3	9.4	9.5	9.7	9.4
	Cond.		420	410	415	410	415
	Temp(C)		15.0	15.0	15.0	15.0	15.0
30	pH		7.7	8.0	8.0	8.0	8.1
	O2 ppm		9.4	9.7	9.8	9.7	9.5
	Cond.		385	375	380	370	380
	Temp(C)		15.0	15.0	15.0	15.0	15.0
20	pH		7.7	8.0	7.9	7.8	8.1
	O2 ppm		9.3	9.7	9.8	9.7	9.5
	Cond.		345	340	340	335	335
	Temp(C)		15.0	15.0	15.0	15.0	15.0
10	pH		7.6	7.9	7.9	7.7	8.0
	O2 ppm		9.6	9.7	9.7	9.8	9.6
	Cond.		305	295	300	295	300
	Temp(C)		15.0	15.0	15.0	15.0	15.0
Control	pH		7.7	7.6	7.6	7.6	7.4
	O2 ppm		9.5	9.8	9.7	9.7	9.6
	Cond.		270	260	260	260	260
	Temp(C)		15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890040

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T.Moran
Date Collected : 05/08/89
Received : 05/08/89
Tested : 05/09/89 at: 1430

Type of Biossay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	19:00	44:10	69:15	97:10	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890040

TEST CONC. %		ELAPSED TIME 00:00	19:00	44:10	69:15	97:10
100	pH	7.2	7.8	7.7	7.8	7.8
	O2 ppm	8.0	9.0	9.6	9.4	9.5
	Cond.	580				550
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.3	7.7	7.6	7.7	7.7
	O2 ppm	8.0	9.1	9.6	9.2	9.3
	Cond.	580				560
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.5	7.2	7.4	7.4
	O2 ppm	10.2	9.8	9.4	9.3	9.4
	Cond.	168				168
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.5	7.3	7.5	7.5
	O2 ppm	10.2	9.7	9.2	9.4	9.6
	Cond.	168				169
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890004

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : CW to Talford Creek, (400)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T. Moran
Date Collected : 01/16/89
Received : 01/16/89
Tested : 01/17/89 at: 1230

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	22:10	47:10	70:00	95:10	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890004

TEST CONC. %		ELAPSED TIME 00:00	22:10	47:10	70:00	95:10
100	pH	7.8	7.7	7.7	7.8	7.8
	O2 ppm	9.4	9.8	9.8	10.4	10.2
	Cond.	224				224
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.7	7.6	7.7	7.8	7.8
	O2 ppm	9.6	10.0	9.8	10.2	10.2
	Cond.	210				210
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.7	7.6	7.6	7.8	7.7
	O2 ppm	9.8	10.0	9.9	10.1	10.2
	Cond.	202				205
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.6	7.7	7.6	7.8	7.7
	O2 ppm	10.2	10.0	10.0	10.2	10.2
	Cond.	186				192
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.6	7.6	7.6	7.8	7.7
	O2 ppm	10.4	10.0	10.0	10.2	10.2
	Cond.	180				189
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.6	7.6	7.6	7.8	7.7
	O2 ppm	10.4	10.2	10.1	10.4	10.2
	Cond.	174				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.7	7.7	7.8	7.7
	O2 ppm	10.4	9.9	9.9	10.0	10.2
	Cond.	170				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.7	7.7	7.8	7.7
	O2 ppm	10.2	10.0	10.0	10.2	10.2
	Cond.	170				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890038

TEST CONDITIONS

Company	: Shell Canada Products Limited Sarnia, ONT (510107)
Region	: Southwest
Industry	: Petroleum Refining
Control point	: CW to Telford Creek, (400)
Laboratory	: Pollutech
Sampling Method	: grab
Sampled By	: T.Moran
Date Collected	: 05/08/89
Received	: 05/08/89
Tested	: 05/09/89 at: 1430
Type of Bioassay	: STATIC (Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).
Test Animal	: Rainbow trout
Weight(gm)	:
Length(mm)	:

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	19:00	44:10	69:15	97:10	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890038

TEST CONC. %		ELAPSED TIME 00:00	19:00	44:10	69:15	97:10
100	pH	7.8	7.6	7.6	7.6	7.5
	O2 ppm	9.1	9.6	9.4	9.2	9.0
	Cond.	216				214
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.7	7.6	7.6	7.6	7.6
	O2 ppm	9.3	9.5	9.5	9.1	9.2
	Cond.	204				203
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.6	7.5	7.5	7.6	7.6
	O2 ppm	9.6	9.6	9.2	9.3	9.4
	Cond.	198				199
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.5	7.5	7.5	7.6	7.6
	O2 ppm	9.8	9.2	9.3	9.2	9.1
	Cond.	182				181
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.5	7.5	7.5	7.5	7.5
	O2 ppm	10.0	9.4	9.4	9.2	9.0
	Cond.	174				175
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.5	7.5	7.5	7.6	7.6
	O2 ppm	10.1	9.6	9.2	9.2	9.4
	Cond.	170				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.5	7.2	7.4	7.4
	O2 ppm	10.2	9.8	9.4	9.3	9.4
	Cond.	168				168
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.5	7.3	7.4	7.4
	O2 ppm	10.2	9.7	9.2	9.6	9.6
	Cond.	168				169
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890005

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : CW from POW, (500)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T. Moran
Date Collected : 01/16/89
Received : 01/16/89
Tested : 01/17/89 at: 1230

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	22:10	47:10	70:00	95:10	TOTAL MORTALITY %
100	0	1	1	1	1	10
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890005

TEST CONC. %		ELAPSED TIME 00:00	22:10	47:10	70:00	95:10
100	pH	7.7	7.6	7.6	7.8	7.7
	O2 ppm	9.6	9.8	9.9	9.6	10.2
	Cond.	262				262
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.7	7.6	7.6	7.8	7.7
	O2 ppm	9.8	10.1	9.8	9.6	9.9
	Cond.	234				245
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.7	7.6	7.6	7.7	7.6
	O2 ppm	9.8	10.2	9.8	9.6	9.9
	Cond.	224				229
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.6	7.6	7.6	7.7	7.7
	O2 ppm	10.2	10.4	9.9	9.6	11.2
	Cond.	200				205
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.6	7.7	7.6	7.8	7.7
	O2 ppm	10.4	10.1	9.9	9.8	10.3
	Cond.	192				199
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.6	7.7	7.6	7.9	7.7
	O2 ppm	10.4	10.4	9.9	10.0	10.2
	Cond.	178				189
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.7	7.7	7.8	7.7
	O2 ppm	10.4	9.9	9.9	10.0	10.2
	Cond.	170				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.7	7.7	7.8	7.7
	O2 ppm	10.2	10.0	10.0	10.2	10.2
	Cond.	170				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0

NISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890039

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : CW from POW, (500)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T.Moran
Date Collected : 05/08/89
Received : 05/08/89
Tested : 05/09/89 at: 1430

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	19:00	44:10	69:15	97:10	TOTAL MORTALITY %
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890039

TEST CONC. %		ELAPSED TIME 00:00	19:00	44:10	69:15	97:10
100	pH	7.8	7.7	7.5	7.6	7.5
	O2 ppm	9.5	9.5	9.6	9.2	9.2
	Cond.	218				218
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.7	7.7	7.6	7.6	7.6
	O2 ppm	9.6	9.5	9.4	9.6	9.7
	Cond.	208				208
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.6	7.6	7.6	7.6	7.6
	O2 ppm	9.6	9.6	9.2	9.6	9.5
	Cond.	198				198
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.5	7.6	7.6	7.6	7.6
	O2 ppm	9.7	9.4	9.6	9.4	9.6
	Cond.	182				181
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.5	7.6	7.6	7.6	7.5
	O2 ppm	9.8	9.3	9.4	9.5	9.1
	Cond.	178				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.5	7.5	7.6	7.6	7.5
	O2 ppm	10.0	9.6	9.6	9.6	9.4
	Cond.	172				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.5	7.2	7.4	7.4
	O2 ppm	10.2	9.8	9.4	9.3	9.4
	Cond.	168				168
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.5	7.3	7.5	7.4
	O2 ppm	10.2	9.7	9.2	9.4	9.6
	Cond.	168				169
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890006

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : CW to POW, (800)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T. Moran
Date Collected : 01/16/89
Received : 01/16/89
Tested : 01/17/89 at: 1230

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).

Test Animal :
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	22:10	47:10	71:10	93:00	TOTAL MORTALITY %
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890006

TEST CONC. %		ELAPSED TIME 00:00	22:10	47:10	71:10	93:00
100	pH	7.8	7.8	7.6	7.8	7.7
	O2 ppm	9.6	9.6	9.8	10.0	10.0
	Cond.	238				245
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.8	7.7	7.6	7.8	7.6
	O2 ppm	9.8	10.0	9.8	10.0	10.1
	Cond.	212				220
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.7	7.7	7.6	7.8	7.6
	O2 ppm	10.0	9.0	9.9	10.0	10.0
	Cond.	206				210
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.7	7.7	7.6	7.8	7.6
	O2 ppm	10.4	10.2	9.7	10.0	10.0
	Cond.	190				192
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.6	7.6	7.5	7.7	7.6
	O2 ppm	10.4	9.7	9.8	9.9	9.9
	Cond.	182				189
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.6	7.7	7.6	7.8	7.6
	O2 ppm	10.2	10.1	9.9	9.8	10.2
	Cond.	174				180
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.7	7.7	7.8	7.7
	O2 ppm	10.4	9.9	9.9	10.0	10.2
	Cond.	170				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.7	7.7	7.8	7.7
	O2 ppm	10.2	10.0	10.0	10.2	10.2
	Cond.	170				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0

COMPANY: Shell Canada Products Limited, Sarnia (510107)
(now with Sarnia Mfg.)
SECTOR: Petroleum Refining
REGION: Southwest

SUMMARY

Results from 14 Daphnia magna acute lethality toxicity tests on samples collected between December 1988 and May 1989 were submitted by Shell Canada Products Limited in Sarnia. Five of the six samples of Process Effluent were not acutely lethal to Daphnia. The sample collected and tested in December was only mildly toxic with a 48 h LC50> 100% effluent.

Toxicity test results submitted for three samples of Intake Water, two samples from CW. to Talford Creek, two samples of CW. from POW and one sample of CW. to Pow were all not acutely lethal to Daphnia magna.

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intake water

05880007 sampled: 12/12/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890007 sampled: 01/16/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890037 sampled: 05/08/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Process Effluent

05880006 sampled: 12/12/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Number of Floating Daphnia Observed

05890008 sampled: 01/16/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890012 sampled: 02/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890027 sampled: 03/28/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890032 sampled: 04/10/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

02890060 sampled: 04/26/89 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

05890040 sampled: 05/08/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

SW to Talford creek

CW to Talford Creek

05890004 sampled: 01/16/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890038 sampled: 05/08/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

CW from POW

05890005 sampled: 01/16/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890039 sampled: 05/08/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

EO from storm pond

SW to Baby creek

CW to POW

05890006 sampled: 01/16/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05880007

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : intake water, (100)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T.Moran
Date Collected : 12/12/88
Received : 12/12/88
Tested : 12/14/88 at: 1200

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	47:00	%
100	0	1	8
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05880007

TEST CONC.		ELAPSED TIME	
%		00:00	47:00
100	pH	7.8	7.8
	O2 ppm	9.4	9.4
	Cond.	200	250
	Temp(C)	20.0	20.0
50	pH	8.1	8.1
	O2 ppm	9.4	9.4
	Cond.	400	390
	Temp(C)	20.0	20.0
26	pH	8.1	8.1
	O2 ppm	9.3	9.3
	Cond.	500	500
	Temp(C)	20.0	20.0
13	pH	8.1	8.1
	O2 ppm	9.2	9.2
	Cond.	510	510
	Temp(C)	20.0	20.0
6	pH	8.1	8.1
	O2 ppm	9.2	9.2
	Cond.	560	560
	Temp(C)	20.0	20.0
Control	pH	8.1	8.1
	O2 ppm	9.4	9.4
	Cond.	560	570
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890007

TEST CONDITIONS

Company	: Shell Canada Products Limited Sarnia, ONT (510107)
Region	: Southwest
Industry	: Petroleum Refining
Control point	: intake water, (100)
Laboratory	: Pollutech
Sampling Method	: Grab
Sampled By	: T.Moran
Date Collected	: 01/16/89
Received	: 01/16/89
Tested	: 01/17/89 at: 1330
Type of Bioassay	: STATIC (Daphnia magna Acute Lethality Toxicity Test Protocol. ONE, 1988)
Test Animal	: D. magna
Weight(gm)	:
Length(mm)	:

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	47:10	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890007

TEST CONC. %		ELAPSED TIME 00:00	47:10
100	pH	7.7	7.8
	O2 ppm	10.0	9.6
	Cond.	172	262
	Temp(C)	20.0	20.0
50	pH	7.9	7.9
	O2 ppm	9.2	9.6
	Cond.	424	422
	Temp(C)	20.0	20.0
26	pH	8.0	8.0
	O2 ppm	9.0	9.5
	Cond.	480	492
	Temp(C)	20.0	20.0
13	pH	8.0	8.0
	O2 ppm	8.8	9.6
	Cond.	504	500
	Temp(C)	20.0	20.0
6	pH	8.0	7.8
	O2 ppm	8.8	9.6
	Cond.	560	590
	Temp(C)	20.0	20.0
Control	pH	8.0	8.0
	O2 ppm	9.0	9.6
	Cond.	580	600
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890037

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : intake water, (100)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T.Moran
Date Collected : 05/08/89
Received : 05/08/89
Tested : 05/09/89 at: 1320

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	48:10	TOTAL MORTALITY %
100	0	0	0
50	0	2	16
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890037

TEST CONC. %		ELAPSED TIME 00:00	48:10
100	pH	7.7	7.8
	O2 ppm	10.2	8.8
	Cond.	260	268
	Temp(C)	20.0	20.0
50	pH	7.9	8.0
	O2 ppm	9.4	8.8
	Cond.	388	390
	Temp(C)	20.0	20.0
26	pH	8.0	8.0
	O2 ppm	9.0	8.6
	Cond.	448	452
	Temp(C)	20.0	20.0
13	pH	8.0	8.1
	O2 ppm	9.0	8.8
	Cond.	478	480
	Temp(C)	20.0	20.0
6	pH	8.0	8.1
	O2 ppm	9.0	8.8
	Cond.	490	500
	Temp(C)	20.0	20.0
Control	pH	8.0	8.1
	O2 ppm	9.2	9.2
	Cond.	500	500
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05880006

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T.Moran
Date Collected : 12/12/88
Received : 12/12/88
Tested : 12/14/88 at: 1100

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	47:30	TOTAL MORTALITY %
100	0	5	41
50	0	4	33
26	0	1	8
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : Number of Floating Daphnia Observed

SLOPE of Mortality Curve :
LC50 Calculated By : >20% <=50% in 100% Concn.

TOXICITY TEST PARAMETERS

Sample Number: 05880006

TEST CONC. %		ELAPSED TIME 00:00	47:30
100	pH	7.2	7.3
	O2 ppm	6.8	7.2
	Cond.	700	720
	Temp(C)	20.0	20.0
50	pH	7.6	7.9
	O2 ppm	8.6	8.6
	Cond.	720	620
	Temp(C)	20.0	20.0
26	pH	7.9	7.9
	O2 ppm	9.2	9.2
	Cond.	600	610
	Temp(C)	20.0	20.0
13	pH	8.1	8.0
	O2 ppm	9.5	9.3
	Cond.	580	605
	Temp(C)	20.0	20.0
6	pH	8.2	8.1
	O2 ppm	9.5	9.3
	Cond.	580	600
	Temp(C)	20.0	20.0
Control	pH	8.3	8.1
	O2 ppm	9.5	9.6
	Cond.	520	590
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890008

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T. Moran
Date Collected : 01/16/89
Received : 01/16/89
Tested : 01/17/89 at: 1415

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME 00:00	47:25	TOTAL MORTALITY
%			%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	1	8
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890008

TEST CONC.		ELAPSED TIME 00:00	47:25
%			
100	pH	7.3	7.6
	O2 ppm	8.0	9.6
	Cond.	600	600
	Temp(C)	20.0	20.0
50	pH	7.7	7.7
	O2 ppm	8.4	9.6
	Cond.	580	600
	Temp(C)	20.0	20.0
26	pH	7.9	7.9
	O2 ppm	8.6	9.5
	Cond.	580	595
	Temp(C)	20.0	20.0
13	pH	8.0	8.0
	O2 ppm	8.6	9.6
	Cond.	580	595
	Temp(C)	20.0	20.0
6	pH	8.0	8.0
	O2 ppm	8.6	9.6
	Cond.	600	600
	Temp(C)	20.0	20.0
Control	pH	8.0	7.9
	O2 ppm	9.0	9.6
	Cond.	580	605
	Temp(C)	80.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890012

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 02/06/89
Received : 02/06/89
Tested : 02/07/89 at: 1615

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 01:25	46:25	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890012

TEST CONC. %		ELAPSED TIME 01:25	46:25
100	pH	7.2	7.5
	O2 ppm	7.0	7.8
	Cond.	980	1100
	Temp(C)	20.0	20.0
50	pH	7.6	7.8
	O2 ppm	8.4	8.2
	Cond.	800	820
	Temp(C)	20.0	20.0
26	pH	7.8	7.9
	O2 ppm	8.6	9.0
	Cond.	720	750
	Temp(C)	20.0	20.0
13	pH	7.9	8.0
	O2 ppm	9.0	9.3
	Cond.	680	700
	Temp(C)	20.0	20.0
6	pH	8.0	8.0
	O2 ppm	9.2	9.4
	Cond.	660	660
	Temp(C)	20.0	20.0
Control	pH	8.0	8.0
	O2 ppm	9.2	9.4
	Cond.	620	650
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890027

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T. MOran
Date Collected : 03/28/89
Received : 03/28/89
Tested : 03/28/89 at: 1400

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	48:00	%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890027

TEST CONC. %		ELAPSED TIME 00:00	48:00
100	pH	7.3	7.6
	O2 ppm	7.9	8.2
	Cond.	710	700
	Temp(C)	20.0	20.0
50	pH	7.6	7.8
	O2 ppm	8.3	8.3
	Cond.	610	610
	Temp(C)	20.0	20.0
26	pH	7.8	7.9
	O2 ppm	8.9	8.6
	Cond.	595	590
	Temp(C)	20.0	20.0
13	pH	7.9	8.0
	O2 ppm	9.2	8.7
	Cond.	580	570
	Temp(C)	20.0	20.0
6	pH	7.9	8.0
	O2 ppm	9.2	9.3
	Cond.	530	510
	Temp(C)	20.0	20.0
Control	pH	7.8	8.0
	O2 ppm	9.6	9.5
	Cond.	510	500
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890032

TEST CONDITIONS

Company	: Shell Canada Products Limited Sarnia, ONT (510107)
Region	: Southwest
Industry	: Petroleum Refining
Control point	: Process Effluent, (200)
Laboratory	: Pollutech
Sampling Method	: Grab
Sampled By	: C. Ferguson
Date Collected	: 04/10/89
Received	: 04/10/89
Tested	: 04/10/89 at: 1540
Type of Bioassay	: STATIC (Daphnia magna Acute Lethality Toxicity Test Protocol. OME, 1988)
Test Animal	: D. magna
Weight(gm)	:
Length(mm)	:

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	48:05	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890032

TEST CONC. %		ELAPSED TIME 00:00	48:05
100	pH	7.4	7.7
	O2 ppm	8.4	8.6
	Cond.	500	550
	Temp(C)	20.0	20.0
50	pH	7.9	7.9
	O2 ppm	8.8	8.6
	Cond.	495	550
	Temp(C)	20.0	20.0
26	pH	8.0	7.9
	O2 ppm	8.9	8.9
	Cond.	490	520
	Temp(C)	20.0	20.0
13	pH	8.1	8.0
	O2 ppm	9.3	9.2
	Cond.	500	472
	Temp(C)	20.0	20.0
6	pH	8.1	8.0
	O2 ppm	9.5	9.3
	Cond.	505	498
	Temp(C)	20.0	20.0
Control	pH	8.0	8.0
	O2 ppm	9.5	9.4
	Cond.	500	505
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 02890060

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : MOE
Sampling Method : grab
Sampled By : D. Hamilton
Date Collected : 04/26/89
Received : 04/27/89
Tested : 04/27/89 at: 1430

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	3	25
60	0	1	1	8
30	0	0	0	0
15	0	1	2	16
5	0	3	3	25
Control	0	0	0	0

48 Hour LC50 : >100%

95% fid. limits : 0.0 - 0.0 %

Comments : MISA Audit

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 02890060

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
100	pH	7.6		8.1
	O2 ppm	9.0		7.9
	Cond.	811		751
	Temp(C)	20.0	20.0	20.0
60	pH	7.8		8.0
	O2 ppm	9.0		7.0
	Cond.	614		589
	Temp(C)	20.0	20.0	20.0
30	pH	7.9		8.1
	O2 ppm	9.0		7.9
	Cond.	472		459
	Temp(C)	20.0	20.0	20.0
15	pH	8.0		8.1
	O2 ppm	9.0		8.0
	Cond.	402		390
	Temp(C)	20.0	20.0	20.0
5	pH	8.1		8.1
	O2 ppm	8.9		8.1
	Cond.	357		350
	Temp(C)	20.0	20.0	20.0
Control	pH	8.1		8.0
	O2 ppm	9.1		8.2
	Cond.	332		330
	Temp(C)	20.0	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890040

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T.Moran
Date Collected : 05/08/89
Received : 05/08/89
Tested : 05/11/89 at: 1400

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	48:00	%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890040

TEST CONC.		ELAPSED TIME 00:00	48:00
%			
100	pH	7.4	7.6
	O2 ppm	8.8	8.6
	Cond.	580	650
	Temp(C)	20.0	20.0
50	pH	7.7	7.8
	O2 ppm	8.8	8.7
	Cond.	540	590
	Temp(C)	20.0	20.0
26	pH	7.9	7.9
	O2 ppm	8.8	8.7
	Cond.	520	550
	Temp(C)	20.0	20.0
13	pH	7.9	7.9
	O2 ppm	8.8	9.4
	Cond.	500	510
	Temp(C)	20.0	20.0
6	pH	8.0	7.9
	O2 ppm	8.8	9.3
	Cond.	500	510
	Temp(C)	20.0	20.0
Control	pH	8.0	7.9
	O2 ppm	8.8	9.2
	Cond.	500	510
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890004

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : CW to Talford Creek, (400)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T. Moran
Date Collected : 01/16/89
Received : 01/16/89
Tested : 01/16/89 at: 1645

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	41:55	%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	1	8
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890004

TEST CONC. %		ELAPSED TIME 00:00	41:55
100	pH	8.0	8.1
	O2 ppm	9.2	8.8
	Cond.	250	250
	Temp(C)	20.0	20.0
50	pH	8.1	8.2
	O2 ppm	9.4	8.9
	Cond.	400	390
	Temp(C)	20.0	20.0
26	pH	8.1	8.2
	O2 ppm	9.4	8.9
	Cond.	480	500
	Temp(C)	20.0	20.0
13	pH	8.2	8.2
	O2 ppm	9.6	8.9
	Cond.	520	520
	Temp(C)	20.0	20.0
6	pH	8.2	8.2
	O2 ppm	10.0	9.0
	Cond.	560	540
	Temp(C)	20.0	20.0
Control	pH	8.1	8.2
	O2 ppm	9.8	9.1
	Cond.	560	580
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890038

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : CW to Talford Creek, (400)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T.Moran
Date Collected : 05/08/89
Received : 05/08/89
Tested : 05/09/89 at: 1300

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	48:10	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	1	8
6	0	0	0
Control			0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890038

TEST CONC. %		ELAPSED TIME 00:00	48:10
100	pH	7.8	7.8
	O2 ppm	9.2	8.6
	Cond.	254	262
	Temp(C)	20.0	20.0
50	pH	7.9	8.0
	O2 ppm	8.8	8.6
	Cond.	382	392
	Temp(C)	20.0	20.0
26	pH	8.0	8.0
	O2 ppm	8.8	8.6
	Cond.	440	420
	Temp(C)	20.0	20.0
13	pH	8.0	8.0
	O2 ppm	8.8	8.6
	Cond.	472	480
	Temp(C)	20.0	20.0
6	pH	8.0	8.1
	O2 ppm	8.8	8.6
	Cond.	486	490
	Temp(C)	20.0	20.0
Control	pH		
	O2 ppm		
	Cond.		
	Temp(C)		

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890005

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : CW from POW, (500)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T. Moran
Date Collected : 01/16/89
Received : 01/16/89
Tested : 01/16/89 at: 1400

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME 02:45	44:30	TOTAL MORTALITY
%			%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890005

TEST CONC.		ELAPSED TIME 02:45	44:30
%			
100	pH	8.0	7.8
	O2 ppm	9.6	8.9
	Cond.	290	270
	Temp(C)	20.0	20.0
50	pH	8.1	8.0
	O2 ppm	9.6	8.8
	Cond.	344	440
	Temp(C)	20.0	20.0
26	pH	8.1	8.1
	O2 ppm	9.6	8.9
	Cond.	490	500
	Temp(C)	20.0	20.0
13	pH	8.2	8.1
	O2 ppm	9.6	9.0
	Cond.	520	540
	Temp(C)	20.0	20.0
6	pH	8.2	8.1
	O2 ppm	9.4	8.9
	Cond.	520	560
	Temp(C)	20.0	20.0
Control	pH	8.1	8.1
	O2 ppm	9.8	9.0
	Cond.	560	560
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890039

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : CW from POW, (500)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T.Moran
Date Collected : 05/08/89
Received : 05/08/89
Tested : 05/09/89 at: 1200

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	49:15	%
100	0	2	16
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control			0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890039

TEST CONC. %		ELAPSED TIME 00:00	49:15
100	pH	7.9	7.8
	O2 ppm	9.2	8.4
	Cond.	254	268
	Temp(C)	20.0	20.0
50	pH	8.0	7.9
	O2 ppm	9.0	8.4
	Cond.	372	384
	Temp(C)	20.0	20.0
26	pH	8.0	8.0
	O2 ppm	8.8	8.6
	Cond.	440	450
	Temp(C)	20.0	20.0
13	pH	8.0	8.0
	O2 ppm	8.8	8.6
	Cond.	460	480
	Temp(C)	20.0	20.0
6	pH	8.0	8.0
	O2 ppm	8.8	8.6
	Cond.	480	498
	Temp(C)	20.0	20.0
Control	pH		
	O2 ppm		
	Cond.		
	Temp(C)		

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890006

TEST CONDITIONS

Company : Shell Canada Products Limited
Sarnia, ONT
(510107)
Region : Southwest
Industry : Petroleum Refining

Control point : CW to POW, (800)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T. Moran
Date Collected : 01/16/89
Received : 01/16/89
Tested : 01/17/89 at: 1330

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	49:00	%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890006

TEST CONC.		ELAPSED TIME 00:00	49:00
%			
100	pH	7.8	7.9
	O2 ppm	9.0	9.6
	Cond.	270	279
	Temp(C)	20.0	20.0
50	pH	7.9	7.9
	O2 ppm	8.8	9.6
	Cond.	430	430
	Temp(C)	20.0	20.0
26	pH	8.0	8.0
	O2 ppm	8.8	9.5
	Cond.	490	510
	Temp(C)	20.0	20.0
13	pH	8.0	8.0
	O2 ppm	8.8	9.6
	Cond.	520	580
	Temp(C)	20.0	20.0
6	pH	8.0	8.0
	O2 ppm	8.8	9.6
	Cond.	520	580
	Temp(C)	20.0	20.0
Control	pH	8.0	8.0
	O2 ppm	9.0	9.6
	Cond.	580	600
	Temp(C)	20.0	20.0

COMPANY: Suncor Inc., Sarnia
(490102)
(now with Sunoco Division)
SECTOR: Petroleum Refining
REGION: Southwest

SUMMARY
The data for six trout bioassays, conducted on process effluent samples collected between December 1988 and May 1989, were provided by Suncor Incorporated. All six process effluent samples were determined to have been non-acutely lethal to test fish. Trout bioassays conducted on intake water samples collected during the same period were determined to have been non-acutely lethal. Data for one trout bioassay conducted on a cooling water sample collected in March 1989 indicate the sample was not acutely lethal.

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intake water

05880004 sampled: 12/12/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890003 sampled: 01/09/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890014 sampled: 02/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890023 sampled: 03/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890030 sampled: 04/03/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890035 sampled: 05/01/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Process Effluent

05880003 sampled: 12/12/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890002 sampled: 01/09/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890013 sampled: 02/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890024 sampled: 03/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

01890032 sampled: 03/29/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA audit sample

05890029 sampled: 04/03/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890034 sampled: 05/01/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

cooling water

05880005 sampled: 12/12/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890025 sampled: 03/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

01890033 sampled: 03/29/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA audit sample

landfarm leachate

Suncor Inc. (continued)

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05880004

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : intake water, (100)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T.Moran
Date Collected : 12/12/88
Received : 12/12/88
Tested : 12/13/88 at: 1130

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME								TOTAL MORTALITY
%	00:00	02:10	03:10	05:00	22:10	46:25	70:25	95:10	%
100	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05880004

TEST CONC. %		ELAPSED TIME 00:00	02:10	03:10	05:00	22:10	46:25	70:25	95:10
100	pH	7.6				7.6	7.7	7.7	7.7
	O2 ppm	10.4				9.6	10.2	10.2	9.8
	Cond.	315							320
	Temp(C)	15.0				15.0	15.0	15.0	15.0
75	pH	7.5				7.7	7.8	7.8	7.8
	O2 ppm	10.3				9.6	10.1	10.3	10.0
	Cond.	275							285
	Temp(C)	15.0				15.0	15.0	15.0	15.0
56	pH	7.3				7.7	7.8	7.8	7.8
	O2 ppm	10.3				9.6	10.0	10.2	10.0
	Cond.	250							253
	Temp(C)	15.0				15.0	15.0	15.0	15.0
25	pH	7.2				7.7	7.8	7.8	7.8
	O2 ppm	10.2				9.6	9.9	10.1	9.9
	Cond.	200							205
	Temp(C)	15.0				15.0	15.0	15.0	15.0
10	pH	7.2				7.6	7.8	7.7	7.8
	O2 ppm	10.0				9.6	9.8	10.1	9.9
	Cond.	165							170
	Temp(C)	15.0				15.0	15.0	15.0	15.0
1	pH	7.1				7.6	7.8	7.7	7.8
	O2 ppm	10.2				9.6	9.9	10.1	10.0
	Cond.	160							160
	Temp(C)	15.0				15.0	15.0	15.0	15.0
Control	pH	7.0				7.6	7.7	7.6	7.6
	O2 ppm	10.2				10.0	10.1	10.2	10.2
	Cond.	162							168
	Temp(C)	15.0				15.0	15.0	15.0	15.0
Control	pH	7.1				7.6	7.6	7.6	7.6
	O2 ppm	10.3				9.9	10.1	10.2	10.1
	Cond.	162							168
	Temp(C)	15.0				15.0	15.0	15.0	15.0

NISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890003

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : intake water, (100)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T. Moran
Date Collected : 01/09/89
Received : 01/09/89
Tested : 01/12/89 at: 1130

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	23:00	47:10	71:10	96:10	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890003

TEST CONC. %		ELAPSED TIME 00:00	23:00	47:10	71:10	96:10
100	pH	7.7	7.8	7.8	7.8	7.8
	O2 ppm	10.5	10.1	10.1	9.9	9.8
	Cond.	318				312
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.7	7.8	7.8	7.8	7.8
	O2 ppm	10.6	10.0	10.1	9.9	9.8
	Cond.	280				278
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.7	7.8	7.8	7.8	7.8
	O2 ppm	10.4	10.0	10.2	10.0	10.0
	Cond.	260				248
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.7	7.7	7.7	7.7	7.8
	O2 ppm	10.4	10.1	10.0	9.9	10.0
	Cond.	205				202
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.7	7.7	7.7	7.7	7.8
	O2 ppm	10.6	10.3	9.8	9.9	10.0
	Cond.	180				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.7	7.7	7.6	7.7	7.7
	O2 ppm	10.5	10.4	9.8	10.0	9.8
	Cond.	170				166
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.7	7.6	7.6	7.8	7.7
	O2 ppm	10.6	10.2	10.2	9.9	10.2
	Cond.	165				164
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.7	7.6	7.6	7.7	7.7
	O2 ppm	10.4	10.3	10.1	10.2	10.0
	Cond.	165				164
	Temp(C)	15.0	15.0	15.0	15.0	15.0

NISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890014

TEST CONDITIONS

Company	: Suncor Inc. Sarnia, ONT (490102)
Region	: Southwest
Industry	: Petroleum Refining
Control point	: intake water, (100)
Laboratory	: Pollutech
Sampling Method	: Grab
Sampled By	: C. Ferguson
Date Collected	: 02/06/89
Received	: 02/06/89
Tested	: 02/07/89 at: 1130
Type of Bioassay	: STATIC (Protocol to determine the acute lethality of liquid effluents to fish. CME, 1983).
Test Animal	: Rainbow trout
Weight(gm)	:
Length(mm)	:

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	26:10	50:00	75:10	96:00	TOTAL MORTALITY %
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890014

TEST CONC. %		ELAPSED TIME 00:00	26:10	50:00	75:10	96:00
100	pH	7.7	7.7	7.6	7.6	7.6
	O2 ppm	10.2	9.6	9.6	9.0	10.1
	Cond.	282				292
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.6	7.7	7.6	7.6	7.6
	O2 ppm	10.4	9.6	9.6	9.6	10.1
	Cond.	252				262
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.6	7.7	7.6	7.6	7.6
	O2 ppm	10.2	9.6	9.6	9.5	10.1
	Cond.	232				242
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.5	7.7	7.6	7.6	7.6
	O2 ppm	10.2	9.6	9.6	9.6	9.8
	Cond.	194				205
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.5	7.6	7.5	7.5	7.6
	O2 ppm	10.2	9.4	9.4	9.6	9.8
	Cond.	168				190
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.4	7.6	7.5	7.6	7.6
	O2 ppm	10.4	9.2	9.2	9.7	10.2
	Cond.	166				179
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.4	7.5	7.3	7.5
	O2 ppm	10.0	9.9	9.9	9.8	10.2
	Cond.	178				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.5	7.5	7.4	7.5
	O2 ppm	10.0	9.8	9.8	9.9	10.2
	Cond.	178				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890023

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : Intake water, (100)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 03/06/89
Received : 03/06/89
Tested : 03/07/89 at: 1530

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	20:00	49:10	68:00	94:10	%
100	0	0	0	1	1	10
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890023

TEST CONC. %		ELAPSED TIME 00:00	20:00	49:10	68:00	94:10
100	pH	7.8	7.8	7.7	7.6	7.7
	O2 ppm	10.5	9.2	9.9	10.2	9.9
	Cond.	310				315
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.8	7.7	7.7	7.7	7.8
	O2 ppm	10.6	9.2	9.9	10.0	10.1
	Cond.	310				315
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.5	7.6	7.5	7.7
	O2 ppm	10.0	9.8	10.1	10.2	10.2
	Cond.	168				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.5	7.6	7.6	7.7
	O2 ppm	9.9	9.6	9.8	10.2	10.3
	Cond.	168				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0

NISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890030

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : intake water, (100)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 04/03/89
Received : 04/03/89
Tested : 04/04/89 at: 1330

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	19:15	46:10	69:00	95:10	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890030

TEST CONC. %		ELAPSED TIME 00:00	19:15	46:10	69:00	95:10
100	pH	7.6	7.6	7.5	7.6	7.6
	O2 ppm	10.2	8.4	9.8	9.9	9.6
	Cond.	310				320
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.6	7.4	7.4	7.5	7.6
	O2 ppm	10.2	9.2	9.7	9.6	9.5
	Cond.	312				320
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.3	7.6	7.3	7.5
	O2 ppm	10.2	9.2	10.1	9.9	10.0
	Cond.	162				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.4	7.6	7.4	7.5
	O2 ppm	10.2	9.2	10.2	10.0	10.0
	Cond.	162				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890035

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : Intake water, (100)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 05/01/89
Received : 05/01/89
Tested : 05/02/89 at: 1400

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	21:30	47:30	72:30	97:30	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890035

TEST CONC.		ELAPSED TIME				
%		00:00	21:30	47:30	72:30	97:30
100	pH	7.7	7.8	7.6	7.6	7.5
	O2 ppm	9.8	9.8	8.8	9.1	9.6
	Cond.	278				298
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.7	7.7	7.6	7.6	7.3
	O2 ppm	10.0	9.9	8.9	9.3	9.6
	Cond.	278				288
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.6	7.6	7.6	7.3
	O2 ppm	10.6	9.8	9.3	9.8	10.1
	Cond.	158				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.6	7.6	7.5	7.3
	O2 ppm	10.4	10.0	9.4	9.9	10.0
	Cond.	170				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0

NISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05880003

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (300)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T. Moran
Date Collected : 12/12/88
Received : 12/12/88
Tested : 12/13/88 at: 1130

Type of Biossay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME								TOTAL MORTALITY
%	00:00	02:10	03:10	05:00	22:10	46:10	70:00	95:10	%
100	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05880003

TEST CONC. %			ELAPSED TIME 00:00	02:10	03:10	05:00	22:10	46:10	70:00	95:10
100	pH	7.2				7.5	7.6	7.5	7.5
	O2 ppm	9.8				9.4	9.8	9.9	10.0
	Cond.	1290							1300
	Temp(C)	15.0				15.0	15.0	15.0	15.0
75	pH	7.2				7.5	7.6	7.6	7.6
	O2 ppm	9.9				9.6	9.8	10.1	10.0
	Cond.	1000							1000
	Temp(C)	15.0				15.0	15.0	15.0	15.0
56	pH	7.2				7.5	7.7	7.6	7.6
	O2 ppm	10.2				9.8	9.8	10.2	10.0
	Cond.	820							820
	Temp(C)	15.0				15.0	15.0	15.0	15.0
25	pH	7.2				7.6	7.7	7.7	7.7
	O2 ppm	10.4				9.7	9.9	10.0	10.0
	Cond.	430							445
	Temp(C)	15.0				15.0	15.0	15.0	15.0
10	pH	7.3				7.6	7.7	7.7	7.7
	O2 ppm	10.8				9.8	9.9	10.1	10.0
	Cond.	280							280
	Temp(C)	15.0				15.0	15.0	15.0	15.0
1	pH	7.3				7.5	7.8	7.7	7.7
	O2 ppm	10.8				9.8	9.8	10.1	10.2
	Cond.	172							175
	Temp(C)	15.0				15.0	15.0	15.0	15.0
Control	pH	7.0				7.6	7.7	7.6	7.6
	O2 ppm	10.2				10.0	10.0	10.1	10.2
	Cond.	162							168
	Temp(C)	15.0				15.0	15.0	15.0	15.0
Control	pH	7.1				7.6	7.6	7.6	7.6
	O2 ppm	10.3				9.9	10.1	10.1	10.1
	Cond.	162							168
	Temp(C)	15.0				15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890002

TEST CONDITIONS

Company	: Suncor Inc. Sarnia, ONT (490102)
Region	: Southwest
Industry	: Petroleum Refining
Control point	: Process Effluent, (300)
Laboratory	: Pollutech
Sampling Method	: Grab
Sampled By	: T. Moran
Date Collected	: 01/09/89
Received	: 01/09/89
Tested	: 01/12/89 at: 1130
Type of Bioassay	: STATIC (Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).
Test Animal	: Rainbow trout
Weight(gm)	:
Length(mm)	:

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	23:00	47:10	71:10	96:10	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890002

TEST CONC. %		ELAPSED TIME 00:00	23:00	47:10	71:10	96:10
100	pH	6.6	6.8	6.9	6.9	6.7
	O2 ppm	9.8	9.5	9.9	9.7	9.8
	Cond.	1120				1080
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.0	7.3	7.2	7.3	7.2
	O2 ppm	9.9	9.5	10.0	9.8	9.8
	Cond.	980				900
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.2	7.5	7.4	7.5	7.4
	O2 ppm	10.0	9.4	10.2	9.9	10.0
	Cond.	700				700
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.6	7.6	7.6	7.6	7.6
	O2 ppm	10.4	9.8	10.2	9.9	10.0
	Cond.	442				448
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.7	7.7	7.7	7.7	7.7
	O2 ppm	10.4	10.0	9.4	9.9	10.2
	Cond.	265				262
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.7	7.7	7.8	7.7	7.7
	O2 ppm	10.4	10.4	9.8	10.0	10.0
	Cond.	175				176
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.7	7.6	7.6	7.8	7.7
	O2 ppm	10.6	10.2	10.2	9.9	10.2
	Cond.	165				164
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.7	7.6	7.6	7.7	7.7
	O2 ppm	10.4	10.3	10.2	10.0	10.0
	Cond.	165				164
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890013

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (300)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 02/06/89
Received : 02/06/89
Tested : 02/07/89 at: 1630

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	21:10	45:00	70:10	95:00	TOTAL MORTALITY %
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890013

TEST CONC. %		ELAPSED TIME 00:00	21:10	45:00	70:10	95:00
100	pH	7.1	7.3	7.3	7.4	7.3
	O2 ppm	9.6	9.5	9.4	9.5	9.8
	Cond.	1000				1050
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.2	7.4	7.4	7.4	7.4
	O2 ppm	9.9	9.5	9.2	9.5	9.8
	Cond.	800				860
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.3	7.5	7.5	7.5	7.5
	O2 ppm	10.4	9.5	9.2	9.8	9.8
	Cond.	650				690
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.4	7.7	7.6	7.5	7.5
	O2 ppm	10.8	9.6	9.0	9.6	9.4
	Cond.	350				372
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.5	7.6	7.5	7.4	7.4
	O2 ppm	11.0	9.3	9.4	9.4	9.2
	Cond.	240				260
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.4	7.6	7.4	7.3	7.3
	O2 ppm	11.0	9.2	9.2	9.8	9.2
	Cond.	170				225
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.7	7.4	7.6	7.6
	O2 ppm	10.8	9.8	9.9	10.0	9.7
	Cond.	162				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.6	7.5	7.5	7.6
	O2 ppm	11.0	9.8	9.8	9.9	9.7
	Cond.	162				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890024

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (300)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 03/06/89
Received : 03/06/89
Tested : 03/07/89 at: 1530

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	20:00	49:10	68:00	94:10	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890024

TEST CONC.		ELAPSED TIME				
%		00:00	20:00	49:10	68:00	94:10
100	pH	7.0	7.3	7.3	7.3	7.2
	O2 ppm	9.0	9.4	9.6	10.2	10.0
	Cond.	1180				1160
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.0	7.1	7.2	7.2	7.2
	O2 ppm	8.9	9.6	9.5	10.0	10.1
	Cond.	1180				1140
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.5	7.6	7.5	7.7
	O2 ppm	10.0	9.8	10.1	10.2	10.2
	Cond.	168				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.5	7.6	7.4	7.7
	O2 ppm	9.9	9.6	9.8	10.2	10.3
	Cond.	168				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 01890032

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (300)

Laboratory : MOE
Sampling Method : grab
Sampled By : D. Hamilton
Date Collected : 03/29/89
Received : 03/30/89
Tested : 03/30/89 at: 1500

Type of Biossay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME						TOTAL MORTALITY
%	00:00	00:30	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : MISA audit sample

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 01890032

TEST CONC. %		ELAPSED TIME 00:00	00:30	24:00	48:00	72:00	96:00
100	pH	7.2	7.5	7.8	7.8	7.7	7.7
	O2 ppm	8.7	9.6	9.6	9.7	9.2	9.3
	Cond.	870	870	900	880	875	880
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
65	pH		7.7	7.9	7.8	7.7	7.7
	O2 ppm		9.8	9.8	10.0	9.3	9.7
	Cond.		670	660	650	650	660
	Temp(C)		15.0	15.0	15.0	15.0	15.0
40	pH		7.8	7.9	7.8	7.6	7.7
	O2 ppm		9.7	9.7	10.0	9.2	9.5
	Cond.		510	520	520	515	520
	Temp(C)		15.0	15.0	15.0	15.0	15.0
30	pH		7.8	7.8	7.7	7.7	7.6
	O2 ppm		9.7	9.7	10.0	9.3	9.5
	Cond.		470	470	465	460	465
	Temp(C)		15.0	15.0	15.0	15.0	15.0
20	pH		7.9	7.9	7.8	7.7	7.7
	O2 ppm		9.7	9.3	10.0	9.4	9.4
	Cond.		405	410	405	405	410
	Temp(C)		15.0	15.0	15.0	15.0	15.0
10	pH		8.0	7.9	7.8	7.5	7.6
	O2 ppm		9.8	9.4	10.0	9.4	9.4
	Cond.		355	365	360	360	365
	Temp(C)		15.0	15.0	15.0	15.0	15.0
Control	pH		7.6	7.8	7.8	7.9	7.9
	O2 ppm		9.7	9.8	9.8	9.7	9.7
	Cond.		260	260	260	260	260
	Temp(C)		15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890029

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (300)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 04/03/89
Received : 04/03/89
Tested : 04/04/89 at: 1330

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	19:15	46:10	69:00	95:10	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890029

TEST CONC.		ELAPSED TIME				
%		00:00	19:15	46:10	69:00	95:10
100	pH	7.3	7.4	7.4	7.4	7.5
	O2 ppm	8.6	8.6	9.4	9.4	9.6
	Cond.	960				960
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.3	7.5	7.4	7.4	7.6
	O2 ppm	8.5	8.8	9.6	9.4	9.4
	Cond.	960				960
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.3	7.6	7.3	7.5
	O2 ppm	10.2	9.2	10.1	9.9	10.0
	Cond.	162				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.4	7.6	7.4	7.5
	O2 ppm	10.2	9.2	10.2	10.0	10.0
	Cond.	162				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890034

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (300)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 05/01/89
Received : 05/01/89
Tested : 05/02/89 at: 1400

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	21:30	47:30	72:30	97:30	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890034

TEST CONC.		ELAPSED TIME				
%		00:00	21:30	47:30	72:30	97:30
100	pH	7.1	7.3	7.3	7.2	7.1
	O2 ppm	8.5	8.5	8.4	9.1	9.5
	Cond.	1100				1100
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.1	7.2	7.2	7.2	7.0
	O2 ppm	8.5	8.4	8.3	9.2	9.6
	Cond.	1100				1090
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.6	7.6	7.6	7.3
	O2 ppm	10.6	9.8	9.3	9.8	10.1
	Cond.	158				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.6	7.6	7.5	7.3
	O2 ppm	10.4	10.0	9.4	9.9	10.0
	Cond.	158				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05880005

TEST CONDITIONS

Company	: Suncor Inc. Sarnia, ONT (490102)
Region	: Southwest
Industry	: Petroleum Refining
Control point	: cooling water, (400)
Laboratory	: Pollutech
Sampling Method	: Grab
Sampled By	: T. Moran
Date Collected	: 12/12/88
Received	: 12/12/88
Tested	: 12/13/88 at: 1130
Type of Bioassay	: STATIC (Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).
Test Animal	: Rainbow trout
Weight(gm)	:
Length(mm)	:

MORTALITY DATA

TEST CONC.	ELAPSED TIME								TOTAL MORTALITY
%	00:00	02:10	03:10	05:00	22:10	46:25	70:25	95:25	%
100	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05880005

TEST CONC. %		ELAPSED TIME 00:00	02:10	03:10	05:00	22:10	46:25	70:25	95:25
100	pH	7.6				7.8	7.7	7.8	7.8
	O2 ppm	10.1				9.6	10.2	10.2	9.8
	Cond.	320							330
	Temp(C)	15.0				15.0	15.0	15.0	15.0
75	pH	7.5				7.7	7.7	7.8	7.8
	O2 ppm	10.2				9.5	9.8	10.1	9.9
	Cond.	280							288
	Temp(C)	15.0				15.0	15.0	15.0	15.0
56	pH	7.3				7.7	7.7	7.8	7.8
	O2 ppm	10.0				9.6	9.9	10.2	9.9
	Cond.	250							270
	Temp(C)	15.0				15.0	15.0	15.0	15.0
25	pH	7.2				7.7	7.7	7.7	7.7
	O2 ppm	10.0				9.7	10.1	10.2	10.0
	Cond.	190							200
	Temp(C)	15.0				15.0	15.0	15.0	15.0
10	pH	7.1				7.6	7.7	7.7	7.7
	O2 ppm	10.0				9.8	10.0	10.2	10.1
	Cond.	175							182
	Temp(C)	15.0				15.0	15.0	15.0	15.0
1	pH	7.1				7.6	7.7	7.7	7.7
	O2 ppm	9.9				9.8	9.9	10.1	10.1
	Cond.	155							170
	Temp(C)	15.0				15.0	15.0	15.0	15.0
Control	pH	7.0				7.6	7.7	7.6	7.6
	O2 ppm	10.2				10.0	10.0	10.1	10.2
	Cond.	162							168
	Temp(C)	15.0				15.0	15.0	15.0	15.0
Control	pH	7.1				7.6	7.6	7.6	7.6
	O2 ppm	10.3				9.9	10.1	10.1	10.2
	Cond.	162							168
	Temp(C)	15.0				15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890025

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : cooling water, (400)

Laboratory : Pollutech
Sampling Method : grab
Sampled By : C. Ferguson
Date Collected : 03/06/89
Received : 03/06/89
Tested : 03/07/89 at: 1520

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	20:10	49:20	68:10	95:10	TOTAL MORTALITY %
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890025

TEST CONC. %		ELAPSED TIME 00:00	20:10	49:20	68:10	95:10
100	pH	7.7	7.8	7.7	7.7	7.7
	O2 ppm	9.8	9.6	9.8	10.2	9.9
	Cond.	318				315
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.7	7.8	7.7	7.7	7.7
	O2 ppm	9.8	9.4	9.7	10.2	9.8
	Cond.	280				280
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.7	7.8	7.7	7.7	7.7
	O2 ppm	9.7	9.4	9.7	10.0	10.1
	Cond.	250				252
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.6	7.7	7.7	7.7	7.7
	O2 ppm	9.6	9.4	9.6	10.0	9.8
	Cond.	202				208
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.6	7.7	7.7	7.6	7.7
	O2 ppm	10.0	9.2	9.9	9.8	9.5
	Cond.	180				188
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.5	7.8	7.8	7.7	7.7
	O2 ppm	9.9	9.6	9.8	10.2	9.8
	Cond.	170				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.5	7.6	7.5	7.7
	O2 ppm	10.0	9.8	10.1	10.2	10.2
	Cond.	168				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.5	7.6	7.6	7.7
	O2 ppm	9.9	9.6	9.8	10.2	10.3
	Cond.	168				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 01890033

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : cooling water, (400)

Laboratory : MOE
Sampling Method : grab
Sampled By : D. Hamilton
Date Collected : 03/29/89
Received : 03/30/89
Tested : 03/30/89 at: 1500

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME						TOTAL MORTALITY
%	00:00	00:30	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : MISA audit sample

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 01890033

TEST CONC. %		ELAPSED TIME 00:00	00:30	24:00	48:00	72:00	96:00
100	pH	7.8	8.1	7.8	7.8	7.6	7.7
	O2 ppm	9.9	10.0	9.2	9.9	9.0	9.1
	Cond.	300	300	315	315	325	325
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
65	pH		8.1	7.6	7.6	7.4	7.6
	O2 ppm		10.1	8.5	9.5	9.0	8.7
	Cond.		295	305	305	310	310
	Temp(C)		15.0	15.0	15.0	15.0	15.0
40	pH		8.0	7.7	7.7	7.6	7.8
	O2 ppm		10.0	9.2	10.1	9.6	9.4
	Cond.		290	300	300	300	300
	Temp(C)		15.0	15.0	15.0	15.0	15.0
30	pH		8.0	7.6	7.6	7.6	7.7
	O2 ppm		10.0	9.1	10.2	9.3	9.3
	Cond.		285	295	290	295	300
	Temp(C)		15.0	15.0	15.0	15.0	15.0
20	pH		8.0	7.4	7.5	7.5	7.6
	O2 ppm		9.9	8.7	9.8	9.1	9.0
	Cond.		280	290	290	290	290
	Temp(C)		15.0	15.0	15.0	15.0	15.0
10	pH		7.9	6.8	7.4	7.3	7.4
	O2 ppm		10.1	8.0	9.3	8.9	8.3
	Cond.		280	290	290	290	295
	Temp(C)		15.0	15.0	15.0	15.0	15.0
Control	pH		7.9	7.9	7.6	7.9	7.8
	O2 ppm		9.7	9.6	9.6	9.7	9.7
	Cond.		260	260	260	260	260
	Temp(C)		15.0	15.0	15.0	15.0	15.0

COMPANY: Suncor Inc., Sarnia
(490102)
(now with Sunoco Division)
SECTOR: Petroleum Refining
REGION: Southwest

SUMMARY

Data for 14 Daphnia magna acute lethality toxicity tests conducted on samples collected between December 1988 and May 1989 were submitted by Suncor Inc. in Sarnia. Six samples of Process Effluent were not acutely lethal to Daphnia.

Seven samples of Intake Water and one sample of Cooling Water were all not acutely lethal to Daphnia.

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intake water

05880004 sampled: 12/12/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890003 sampled: 01/09/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890014 sampled: 02/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890023 sampled: 03/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890030 sampled: 04/03/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890035 sampled: 05/01/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Process Effluent

05880003 sampled: 12/12/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890002 sampled: 01/09/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890013 sampled: 02/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890024 sampled: 03/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

02890032 sampled: 03/29/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

05890029 sampled: 04/03/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890034 sampled: 05/01/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

cooling water

05880005 sampled: 12/12/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

05890025 sampled: 03/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

02890033 sampled: 03/29/89 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

landfarm leachate

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05880004

TEST CONDITIONS

Company	: Suncor Inc. Sarnia, ONT (490102)
Region	: Southwest
Industry	: Petroleum Refining
Control point	: intake water, (100)
Laboratory	: Pollutech
Sampling Method	: Grab
Sampled By	: T.Moran
Date Collected	: 12/12/88
Received	: 12/12/88
Tested	: 12/14/88 at: 1000
Type of Bioassay	: STATIC (Daphnia magna Acute Lethality Toxicity Test Protocol. ONE, 1988)
Test Animal	: D. magna
Weight(gm)	:
Length(mm)	:

MORTALITY DATA

TEST CONC.	ELAPSED TIME 00:00	47:30	TOTAL MORTALITY
%			%
100	0	0	0
50	0	0	0
26	0	1	8
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05880004

TEST CONC. %		ELAPSED TIME 00:00	47:30
100	pH	7.8	7.8
	O2 ppm	10.4	9.3
	Cond.	300	370
	Temp(C)	20.0	20.0
50	pH	7.9	7.9
	O2 ppm	10.0	9.3
	Cond.	400	468
	Temp(C)	20.0	20.0
26	pH	8.1	8.0
	O2 ppm	9.8	9.3
	Cond.	500	500
	Temp(C)	20.0	20.0
13	pH	8.1	8.0
	O2 ppm	9.7	9.3
	Cond.	520	520
	Temp(C)	20.0	20.0
6	pH	8.1	8.0
	O2 ppm	9.5	9.3
	Cond.	640	600
	Temp(C)	20.0	20.0
Control	pH	8.1	8.0
	O2 ppm	9.5	9.2
	Cond.	660	600
	Temp(C)	20.0	20.0

NISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890003

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : intake water, (100)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T. Moran
Date Collected : 01/09/89
Received : 01/09/89
Tested : 01/09/89 at: 1530

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	48:10	%
100	0	1	8
50	0	0	0
26	0	0	0
13	0	0	0
6	0	1	8
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890003

TEST CONC. %		ELAPSED TIME 00:00	48:10
100	pH	7.4	7.8
	O2 ppm	10.2	8.8
	Cond.	360	370
	Temp(C)	20.0	20.0
50	pH	7.8	8.0
	O2 ppm	9.9	8.8
	Cond.	460	470
	Temp(C)	20.0	20.0
26	pH	8.0	8.1
	O2 ppm	9.8	8.8
	Cond.	520	520
	Temp(C)	20.0	20.0
13	pH	8.1	8.1
	O2 ppm	9.6	8.8
	Cond.	570	570
	Temp(C)	20.0	20.0
6	pH	8.1	8.1
	O2 ppm	9.6	8.9
	Cond.	590	590
	Temp(C)	20.0	20.0
Control	pH	8.2	8.0
	O2 ppm	9.4	9.2
	Cond.	590	600
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890014

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : intake water, (100)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 02/06/89
Received : 02/06/89
Tested : 02/06/89 at: 1715

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	47:15	%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890014

TEST CONC. %		ELAPSED TIME 00:00	47:15
100	pH	7.7	7.9
	O2 ppm	10.2	9.1
	Cond.	288	320
	Temp(C)	20.0	20.0
50	pH	7.9	8.0
	O2 ppm	8.8	9.0
	Cond.	430	480
	Temp(C)	20.0	20.0
26	pH	8.0	8.0
	O2 ppm	8.4	9.0
	Cond.	490	520
	Temp(C)	20.0	20.0
13	pH	8.0	8.0
	O2 ppm	8.0	9.0
	Cond.	520	580
	Temp(C)	20.0	20.0
6	pH	8.0	8.1
	O2 ppm	8.0	9.1
	Cond.	520	600
	Temp(C)	20.0	20.0
Control	pH	8.0	8.0
	O2 ppm	8.6	9.1
	Cond.	540	600
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890023

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : intake water, (100)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 03/06/89
Received : 03/06/89
Tested : 03/07/89 at: 1100

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	48:30	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890023

TEST CONC. %		ELAPSED TIME 00:00	48:30
100	pH	7.9	7.8
	O2 ppm	9.8	9.4
	Cond.	350	355
	Temp(C)	20.0	20.0
50	pH	8.0	7.9
	O2 ppm	9.4	9.4
	Cond.	452	465
	Temp(C)	20.0	20.0
26	pH	8.1	8.0
	O2 ppm	9.2	9.5
	Cond.	520	550
	Temp(C)	20.0	20.0
13	pH	8.1	8.0
	O2 ppm	9.2	9.5
	Cond.	550	590
	Temp(C)	20.0	20.0
6	pH	8.1	8.0
	O2 ppm	9.2	9.4
	Cond.	580	600
	Temp(C)	20.0	20.0
Control	pH	8.1	8.0
	O2 ppm	9.1	9.4
	Cond.	600	610
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890030

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : intake water, (100)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 04/03/89
Received : 04/03/89
Tested : 04/04/89 at: 1515

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	48:20	%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890030

TEST CONC. %		ELAPSED TIME 00:00	48:20
100	pH	7.7	7.7
	O2 ppm	9.4	9.3
	Cond.	320	370
	Temp(C)	20.0	20.0
50	pH	7.8	7.8
	O2 ppm	9.4	9.4
	Cond.	420	450
	Temp(C)	20.0	20.0
26	pH	7.9	7.9
	O2 ppm	9.0	9.4
	Cond.	480	500
	Temp(C)	20.0	20.0
13	pH	8.0	7.9
	O2 ppm	8.8	9.2
	Cond.	500	520
	Temp(C)	20.0	20.0
6	pH	8.0	7.9
	O2 ppm	8.8	9.4
	Cond.	500	550
	Temp(C)	20.0	20.0
Control	pH	8.0	8.0
	O2 ppm	9.2	9.3
	Cond.	520	560
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890035

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : intake water, (100)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 05/01/89
Received : 05/01/89
Tested : 05/03/89 at: 1115

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	48:20	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890035

TEST CONC. %		ELAPSED TIME 00:00	48:20
100	pH	7.8	7.8
	O2 ppm	10.4	8.5
	Cond.	308	338
	Temp(C)	20.0	20.0
50	pH	7.9	7.8
	O2 ppm	9.8	8.5
	Cond.	402	422
	Temp(C)	20.0	20.0
26	pH	8.0	7.9
	O2 ppm	9.8	8.5
	Cond.	448	452
	Temp(C)	20.0	20.0
13	pH	8.0	8.0
	O2 ppm	9.8	9.0
	Cond.	468	478
	Temp(C)	20.0	20.0
6	pH	8.0	8.0
	O2 ppm	9.6	9.2
	Cond.	470	478
	Temp(C)	20.0	20.0
Control	pH	8.0	8.0
	O2 ppm	9.8	9.2
	Cond.	490	510
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05880003

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (300)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T.Moran
Date Collected : 12/12/88
Received : 12/12/88
Tested : 12/13/88 at: 1245

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	01:00	46:25	%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	1	8
6	0	1	8
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05880003

TEST CONC.		ELAPSED TIME 01:00	46:25
%			
100	pH	7.5	7.6
	O2 ppm	8.9	8.8
	Cond.	1480	1480
	Temp(C)	20.0	20.0
50	pH	7.9	7.9
	O2 ppm	8.9	8.8
	Cond.	1040	1050
	Temp(C)	20.0	20.0
26	pH	8.1	8.1
	O2 ppm	9.0	9.1
	Cond.	820	820
	Temp(C)	20.0	20.0
13	pH	8.1	8.1
	O2 ppm	9.0	9.0
	Cond.	700	700
	Temp(C)	20.0	20.0
6	pH	8.2	8.1
	O2 ppm	9.0	9.2
	Cond.	640	650
	Temp(C)	20.0	20.0
Control	pH	8.2	8.1
	O2 ppm	9.0	9.2
	Cond.	600	600
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890002

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (300)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T.Moran
Date Collected : 01/09/89
Received : 01/09/89
Tested : 01/10/89 at: 1215

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	47:15	%
100	0	1	8
50	0	1	8
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05890002

TEST CONC. %		ELAPSED TIME 00:00	47:15
100	pH	6.7	6.8
	O2 ppm	9.8	8.6
	Cond.	1220	1250
	Temp(C)	20.0	20.0
50	pH	7.7	7.7
	O2 ppm	9.9	8.7
	Cond.	920	910
	Temp(C)	20.0	20.0
26	pH	8.0	7.9
	O2 ppm	9.7	8.8
	Cond.	790	780
	Temp(C)	20.0	20.0
13	pH	8.0	7.9
	O2 ppm	9.9	9.3
	Cond.	700	680
	Temp(C)	20.0	20.0
6	pH	8.1	8.0
	O2 ppm	9.9	9.4
	Cond.	650	610
	Temp(C)	20.0	20.0
Control	pH	8.0	7.9
	O2 ppm	9.9	9.4
	Cond.	590	590
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890013

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (300)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 02/06/89
Received : 02/06/89
Tested : 02/06/89 at: 1745

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:10	48:10	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890013

TEST CONC. %		ELAPSED TIME 00:10	48:10
100	pH	7.3	7.4
	O2 ppm	7.8	8.7
	Cond.	1040	1120
	Temp(C)	20.0	20.0
50	pH	7.8	7.8
	O2 ppm	7.8	8.6
	Cond.	820	860
	Temp(C)	20.0	20.0
26	pH	8.0	8.0
	O2 ppm	7.8	8.7
	Cond.	700	740
	Temp(C)	20.0	20.0
13	pH	8.0	8.0
	O2 ppm	7.8	8.7
	Cond.	640	680
	Temp(C)	20.0	20.0
6	pH	8.1	8.1
	O2 ppm	8.0	8.7
	Cond.	600	620
	Temp(C)	20.0	20.0
Control	pH	8.0	8.1
	O2 ppm	8.6	8.7
	Cond.	540	600
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890024

TEST CONDITIONS

Company	: Suncor Inc. Sarnia, ONT (490102)
Region	: Southwest
Industry	: Petroleum Refining
Control point	: Process Effluent, (300)
Laboratory	: Pollutech
Sampling Method	: Grab
Sampled By	: C. Ferguson
Date Collected	: 03/06/89
Received	: 03/06/89
Tested	: 03/07/89 at: 1600
Type of Bioassay	: STATIC (Daphnia magna Acute Lethality Toxicity Test Protocol. ONE, 1988)
Test Animal	: D. magna
Weight(gm)	:
Length(mm)	:

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	47:50	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890024

TEST CONC. %		ELAPSED TIME 00:00	47:50
100	pH	7.0	7.1
	O2 ppm	9.2	8.2
	Cond.	1100	1220
	Temp(C)	20.0	20.0
50	pH	7.7	7.6
	O2 ppm	9.0	8.6
	Cond.	880	950
	Temp(C)	20.0	20.0
26	pH	7.8	7.8
	O2 ppm	9.0	8.9
	Cond.	760	800
	Temp(C)	20.0	20.0
13	pH	7.9	7.8
	O2 ppm	9.0	8.9
	Cond.	680	695
	Temp(C)	20.0	20.0
6	pH	7.9	7.9
	O2 ppm	9.0	9.0
	Cond.	620	640
	Temp(C)	20.0	20.0
Control	pH	8.0	8.0
	O2 ppm	9.4	9.4
	Cond.	580	610
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 02890032

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (300)

Laboratory : MOE
Sampling Method : grab
Sampled By : D. Hamilton
Date Collected : 03/29/89
Received : 03/30/89
Tested : 03/30/89 at: 1536

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
60	0	0	0	0
30	0	0	0	0
15	0	0	0	0
5	0	0	0	0
Control	0	1	1	8

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : MISA Audit

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 02890032

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
100	pH	7.5		7.7
	O2 ppm	8.9		7.5
	Cond.	1091		1082
	Temp(C)	20.0	20.0	20.0
60	pH	7.8		7.9
	O2 ppm	9.0		7.7
	Cond.	781		775
	Temp(C)	20.0	20.0	20.0
30	pH	8.0		8.0
	O2 ppm	8.9		8.1
	Cond.	560		558
	Temp(C)	20.0	20.0	20.0
15	pH	8.0		8.1
	O2 ppm	8.8		8.2
	Cond.	443		439
	Temp(C)	20.0	20.0	20.0
5	pH	8.1		8.2
	O2 ppm	8.8		8.3
	Cond.	368		365
	Temp(C)	20.0	20.0	20.0
Control	pH	8.1		8.2
	O2 ppm	9.0		8.5
	Cond.	337		330
	Temp(C)	20.0	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890029

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (300)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 04/03/89
Received : 04/03/89
Tested : 04/04/89 at: 1500

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	48:30	%
100	0	1	8
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890029

TEST CONC. %		ELAPSED TIME 00:00	48:30
100	pH	7.4	7.6
	O2 ppm	8.8	9.2
	Cond.	980	1080
	Temp(C)	20.0	20.0
50	pH	7.7	7.8
	O2 ppm	8.8	9.2
	Cond.	780	800
	Temp(C)	20.0	20.0
26	pH	7.8	7.8
	O2 ppm	8.8	9.3
	Cond.	660	700
	Temp(C)	20.0	20.0
13	pH	7.9	7.9
	O2 ppm	8.8	9.2
	Cond.	600	610
	Temp(C)	20.0	20.0
6	pH	7.9	7.9
	O2 ppm	8.8	9.2
	Cond.	540	580
	Temp(C)	20.0	20.0
Control	pH	8.0	7.9
	O2 ppm	9.2	9.1
	Cond.	520	550
	Temp(C)	20.0	20.0

NISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890034

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : Process Effluent, (300)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 05/01/89
Received : 05/01/89
Tested : 05/03/89 at: 1010

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	48:10	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890034

TEST CONC. %		ELAPSED TIME 00:00	48:10
100	pH	7.3	7.3
	O2 ppm	9.2	8.2
	Cond.	1120	1250
	Temp(C)	20.0	20.0
50	pH	7.9	7.7
	O2 ppm	9.6	8.4
	Cond.	820	900
	Temp(C)	20.0	20.0
26	pH	8.0	7.9
	O2 ppm	9.8	8.5
	Cond.	640	700
	Temp(C)	20.0	20.0
13	pH	8.0	8.0
	O2 ppm	9.6	8.4
	Cond.	520	600
	Temp(C)	20.0	20.0
6	pH	8.1	8.0
	O2 ppm	9.6	8.9
	Cond.	360	550
	Temp(C)	20.0	20.0
Control	pH	8.0	8.0
	O2 ppm	9.8	9.2
	Cond.	490	510
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05880005

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : cooling water, (400)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : T.Moran
Date Collected : 12/12/88
Received : 12/12/88
Tested : 12/14/88 at: 1030

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	48:10	%
100	0	0	0
50	0	0	0
26	0	1	8
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 05880005

TEST CONC. %		ELAPSED TIME 00:00	48:10
100	pH	7.9	7.9
	O2 ppm	10.2	9.6
	Cond.	300	370
	Temp(C)	20.0	20.0
50	pH	8.0	8.0
	O2 ppm	9.8	9.6
	Cond.	460	472
	Temp(C)	20.0	20.0
26	pH	8.2	8.1
	O2 ppm	9.6	9.6
	Cond.	500	520
	Temp(C)	20.0	20.0
13	pH	8.2	8.1
	O2 ppm	9.6	9.4
	Cond.	520	560
	Temp(C)	20.0	20.0
6	pH	8.2	8.1
	O2 ppm	9.6	9.4
	Cond.	520	560
	Temp(C)	20.0	20.0
Control	pH	8.2	8.1
	O2 ppm	9.6	9.4
	Cond.	560	600
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890025

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : cooling water, (400)

Laboratory : Pollutech
Sampling Method : Grab
Sampled By : C. Ferguson
Date Collected : 03/06/89
Received : 03/06/89
Tested : 03/07/89 at: 1630

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal :
Weight(gm) :
Length(mm) : D. magna

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	48:10	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 05890025

TEST CONC. %		ELAPSED TIME 00:00	48:10
100	pH	7.9	7.7
	O2 ppm	9.8	9.4
	Cond.	320	360
	Temp(C)	20.0	20.0
50	pH	8.0	7.9
	O2 ppm	10.0	9.2
	Cond.	480	435
	Temp(C)	20.0	20.0
26	pH	8.0	7.9
	O2 ppm	9.2	9.5
	Cond.	520	420
	Temp(C)	20.0	20.0
13	pH	8.0	8.0
	O2 ppm	9.0	9.4
	Cond.	540	600
	Temp(C)	20.0	20.0
6	pH	8.0	8.0
	O2 ppm	9.0	9.4
	Cond.	580	610
	Temp(C)	20.0	20.0
Control	pH	8.0	7.9
	O2 ppm	9.4	9.3
	Cond.	580	610
	Temp(C)	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 02890033

TEST CONDITIONS

Company : Suncor Inc.
Sarnia, ONT
(490102)
Region : Southwest
Industry : Petroleum Refining

Control point : cooling water, (400)

Laboratory : MOE
Sampling Method : grab
Sampled By : D. Hamilton
Date Collected : 03/29/89
Received : 03/30/89
Tested : 03/30/89 at: 1555

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	2	2	16
60	0	0	0	0
30	0	0	0	0
15	0	1	1	8
5	0	0	0	0
Control	0	0	1	8

48 Hour LC50 : >100%

95% fid. limits : 0.0 - 0.0 %

Comments : MISA Audit

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 02890033

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
100	pH	8.1		8.2
	O2 ppm	10.1		8.3
	Cond.	382		379
	Temp(C)	20.0	20.0	20.0
60	pH	8.1		8.2
	O2 ppm	8.9		8.3
	Cond.	360		351
	Temp(C)	20.0	20.0	20.0
30	pH	8.1		8.2
	O2 ppm	8.7		8.3
	Cond.	346		341
	Temp(C)	20.0	20.0	20.0
15	pH	8.2		8.3
	O2 ppm	8.7		8.2
	Cond.	338		340
	Temp(C)	20.0	20.0	20.0
5	pH	8.2		8.3
	O2 ppm	8.6		8.3
	Cond.	334		334
	Temp(C)	20.0	20.0	20.0
Control	pH	8.2		8.3
	O2 ppm	8.8		8.3
	Cond.	330		335
	Temp(C)	20.0	20.0	20.0

COMPANY: Texaco Canada Inc., Nanticoke (520205)
(now with Nanticoke Refinery)
SECTOR: Petroleum Refining
REGION: West Central

SUMMARY
The data for six trout bioassays, conducted on process effluent samples collected between December 1988 and May 1989, were provided by Texaco Canada Incorporated. All six process effluent samples were determined to have been non-acutely lethal to test fish.

Process Effluent

06881220 sampled: 12/12/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

06890126 sampled: 01/24/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

06890210 sampled: 02/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or sublethal impairment observed

06890308 sampled: 03/07/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or sublethal impairment observed

06890405 sampled: 04/04/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or sublethal impairment observed

06890529 sampled: 05/09/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or sublethal impairment observed

01890108 sampled: 05/31/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA audit sample.

storm water

Texaco Canada Inc. (continued)

landfarm leachate

EO-leachate-creek

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 06881220

TEST CONDITIONS

Company : Texaco Canada Inc.
Nanticoke, ONT
(520205)
Region : West Central
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Beak
Sampling Method : 24hr. Comp
Sampled By : Texaco
Date Collected : 12/12/88
Received : 12/14/88
Tested : 12/14/88 at: 1400

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : Moving average

TOXICITY TEST PARAMETERS

Sample Number: 06881220

TEST CONC.		ELAPSED TIME				
%		00:00	24:00	48:00	72:00	96:00
100	pH	7.8	8.3	8.3	8.4	8.4
	O2 ppm	7.8	9.8	9.2	10.3	10.2
	Cond.	1301				1341
	Temp(C)	15.0	15.0	15.0	15.0	15.0
50	pH	7.8	8.3	8.3	8.3	8.3
	O2 ppm	8.2	9.2	9.9	9.8	9.5
	Cond.	824				830
	Temp(C)	15.0	15.0	15.0	15.0	15.0
30	pH	7.7	7.9	8.3	8.3	8.3
	O2 ppm	7.0	8.2	9.7	10.4	9.7
	Cond.	647				649
	Temp(C)	15.0	15.0	15.0	15.0	15.0
20	pH	7.7	8.2	8.3	8.2	8.2
	O2 ppm	7.5	6.9	9.2	8.9	9.6
	Cond.	548				550
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.7	7.9	8.2	8.2	8.2
	O2 ppm	7.6	7.2	9.3	8.9	9.8
	Cond.	450				448
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.5	8.0	8.2	8.1	8.0
	O2 ppm	7.2	8.6	8.0	8.2	8.2
	Cond.	352				360
	Temp(C)	15.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 06890126

TEST CONDITIONS

Company : Texaco Canada Inc.
Nanticoke, ONT
(520205)
Region : West Central
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Beak
Sampling Method : grab
Sampled By : Rob Bumelis
Date Collected : 01/24/89
Received : 01/25/89
Tested : 01/25/89 at: 1400

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890126

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
100	pH	8.3	8.5	8.6	8.5	8.7
	O2 ppm	8.6	8.2	9.5	9.2	8.8
	Cond.	3041				3330
	Temp(C)	15.0	15.0	15.0	15.0	16.0
50	pH	8.2	8.4	8.4	8.3	8.5
	O2 ppm	9.0	8.0	8.9	8.6	9.0
	Cond.	1762				1908
	Temp(C)	15.0	15.0	15.0	15.0	16.0
30	pH	8.0	8.1	8.4	8.2	8.3
	O2 ppm	9.2	8.9	9.5	9.7	9.3
	Cond.	1269				1275
	Temp(C)	15.0	15.0	15.0	15.0	16.0
20	pH	8.0	8.3	8.3	8.3	8.4
	O2 ppm	8.2	8.0	8.8	8.9	8.7
	Cond.	992				1039
	Temp(C)	15.0	15.0	15.0	15.0	16.0
10	pH	7.8	8.2	8.2	8.2	8.3
	O2 ppm	9.0	8.8	9.2	9.0	9.8
	Cond.	710				728
	Temp(C)	15.0	15.0	15.0	15.0	16.0
Control	pH	7.7	8.0	8.1	8.1	8.1
	O2 ppm	8.8	9.2	9.0	9.1	9.1
	Cond.	397				430
	Temp(C)	15.0	15.0	15.0	15.0	16.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 06890210

TEST CONDITIONS

Company	: Texaco Canada Inc. Nanticoke, ONT (520205)
Region	: West Central
Industry	: Petroleum Refining
Control point	: Process Effluent, (200)
Laboratory	: Beak
Sampling Method	: grab
Sampled By	: Rob Bumelis
Date Collected	: 02/06/89
Received	: 02/07/89
Tested	: 02/07/89 at: 1600
Type of Bioassay	: STATIC (Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).
Test Animal	: Rainbow trout
Weight(gm)	:
Length(mm)	:

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or sublethal impairment observed

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890210

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
100	pH	7.7	8.1	8.1	8.1	8.2
	O2 ppm	10.2	9.3	9.3	9.6	9.2
	Cond.	1990				2190
	Temp(C)	13.0	14.0	14.0	15.0	16.0
50	pH	7.7	8.2	8.2	8.2	8.3
	O2 ppm	9.9	10.4	10.4	10.1	10.2
	Cond.	1230				1368
	Temp(C)	14.0	14.0	14.0	15.0	16.0
30	pH	7.6	8.1	8.2	8.1	8.2
	O2 ppm	9.8	10.4	10.4	9.9	10.1
	Cond.	876				983
	Temp(C)	14.0	14.0	14.0	15.0	16.0
20	pH	7.6	8.0	8.1	8.1	8.1
	O2 ppm	9.8	10.0	9.4	9.2	9.3
	Cond.	718				809
	Temp(C)	15.0	14.0	14.0	15.0	16.0
10	pH	7.5	7.9	8.0	7.9	8.1
	O2 ppm	9.8	9.6	9.6	9.4	9.4
	Cond.	554				629
	Temp(C)	15.0	14.0	14.0	15.0	16.0
Control	pH	7.4	7.8	7.9	7.8	8.0
	O2 ppm	9.8	10.0	10.2	9.8	9.7
	Cond.	382				398
	Temp(C)	15.0	14.0	14.0	15.0	16.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 06890308

TEST CONDITIONS

Company : Texaco Canada Inc.
Nanticoke, ONT
(520205)
Region : West Central
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Beak
Sampling Method : grab
Sampled By : Rob Bumelis
Date Collected : 03/07/89
Received : 03/08/89
Tested : 03/08/89 at: 1500

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or sublethal impairment observed

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890308

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
100	pH	8.0	7.9	8.0	7.9	7.9
	O2 ppm	11.0	9.8	10.0	8.7	9.0
	Cond.	2200				2100
	Temp(C)	15.0	14.0	15.0	15.0	15.0
50	pH	8.0	8.0	8.0	7.9	7.9
	O2 ppm	10.2	10.2	10.4	9.0	8.6
	Cond.	1269				1296
	Temp(C)	15.0	14.0	15.0	15.0	15.0
30	pH	8.1	8.0	8.0	7.9	7.9
	O2 ppm	10.4	10.4	10.3	9.3	9.5
	Cond.	923				930
	Temp(C)	15.0	14.0	15.0	15.0	15.0
20	pH	8.0	8.0	7.9	7.7	7.7
	O2 ppm	10.2	10.2	10.4	8.3	8.2
	Cond.	739				742
	Temp(C)	15.0	14.0	15.0	15.0	15.0
10	pH	7.8	8.0	7.8	7.6	7.7
	O2 ppm	10.0	10.0	9.5	8.0	8.6
	Cond.	573				565
	Temp(C)	15.0	14.0	15.0	15.0	15.0
Control	pH	7.4	7.9	7.8	7.3	7.5
	O2 ppm	9.4	9.8	9.8	7.8	7.8
	Cond.	438				378
	Temp(C)	15.0	14.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 06890405

TEST CONDITIONS

Company : Texaco Canada Inc.
Nanticoke, ONT
(520205)
Region : West Central
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Beak
Sampling Method : grab
Sampled By : Rob Bumelis
Date Collected : 04/04/89
Received : 04/05/89
Tested : 04/05/89 at: 1400

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or sublethal impairment observed

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890405

TEST CONC.		ELAPSED TIME				
%		00:00	24:00	48:00	72:00	96:00
100	pH	8.1	8.2	8.6	8.4	8.5
	O2 ppm	9.2	8.3	8.6	9.0	7.8
	Cond.	1983				1945
	Temp(C)	15.0	15.0	15.0	14.0	14.0
100	pH	8.2	8.5	8.7	8.6	8.7
	O2 ppm	9.3	9.4	9.8	9.9	8.2
	Cond.	2070				2050
	Temp(C)	15.0	15.0	15.0	14.0	14.0
Control	pH	8.1	8.5	8.6	8.6	8.6
	O2 ppm	9.3	9.4	9.3	9.0	8.1
	Cond.	361				382
	Temp(C)	15.0	15.0	15.0	14.0	14.0
Control	pH	8.1	8.5	8.5	8.6	8.6
	O2 ppm	9.1	9.2	9.1	9.1	8.4
	Cond.	363				384
	Temp(C)	15.0	15.0	15.0	14.0	14.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 06890529

TEST CONDITIONS

Company : Texaco Canada Inc.
Nanticoke, ONT
(520205)
Region : West Central
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Beak
Sampling Method : grab
Sampled By : Rob Bumelis
Date Collected : 05/09/89
Received : 05/10/89
Tested : 05/10/89 at: 1500

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
65	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or sublethal impairment observed

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890529

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00	72:00	96:00
100	pH	8.3	8.1	8.2	8.2	8.1
	O2 ppm	6.5	8.8	8.5	8.3	9.3
	Cond.	1239	1218	1572	1580	1574
	Temp(C)	14.0	15.0	15.0	15.0	15.0
65	pH	8.3	8.2	8.1	8.1	8.0
	O2 ppm	8.1	8.3	8.4	7.5	9.0
	Cond.	1168	1078	1151	1158	1155
	Temp(C)	14.0	15.0	15.0	15.0	15.0
50	pH	8.2	8.1	8.0	8.1	8.0
	O2 ppm	7.2	7.5	8.2	8.2	8.0
	Cond.	762	748	973	764	780
	Temp(C)	14.0	15.0	15.0	15.0	15.0
30	pH	8.1	8.1	8.0	8.1	8.0
	O2 ppm	8.1	7.5	8.0	8.7	8.6
	Cond.	659	658	625	563	635
	Temp(C)	14.0	15.0	15.0	15.0	15.0
20	pH	8.2	8.2	8.1	8.0	8.0
	O2 ppm	8.5	7.2	8.5	8.2	8.4
	Cond.	584	554	581	559	598
	Temp(C)	14.0	15.0	15.0	15.0	15.0
10	pH	8.1	8.2	8.1	7.9	8.0
	O2 ppm	8.6	8.8	9.0	8.5	8.6
	Cond.	472	468	479	499	499
	Temp(C)	14.0	15.0	15.0	15.0	15.0
Control	pH	8.0	8.1	8.1	7.7	7.9
	O2 ppm	8.1	8.2	8.0	7.7	8.5
	Cond.	348	347	354	358	362
	Temp(C)	14.0	15.0	15.0	15.0	15.0

MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 01890108

TEST CONDITIONS

Company : Texaco Canada Inc.
Nanticoke, ONT
(520205)
Region : West Central
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : MOE
Sampling Method : grab
Sampled By : G. Perkons
Date Collected : 05/31/89
Received : 05/31/89
Tested : 05/31/89 at: 1100

Type of Bioassay : STATIC
(Protocol to determine the acute lethality of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME						TOTAL MORTALITY
%	00:00	03:00	23:45	46:00	73:45	96:30	%
100	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0
30	0	0	0	0	0	1	10
20	0	0	0	0	0	0	0
10	0	0	0	0	0	1	10
Control	0	0	0	0	0	1	10

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : MISA audit sample.

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 01890108

TEST CONC. %		ELAPSED TIME 00:00	03:00	23:45	46:00	73:45	96:30
100	pH	7.5	8.0	8.1	8.2	8.3	7.3
	O2 ppm	8.0	8.7	9.6	9.7	9.5	9.1
	Cond.	1800	1800	1590	1550	1550	1500
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
65	pH		7.9	8.0	8.1	8.2	7.4
	O2 ppm		9.3	9.7	9.7	9.4	9.2
	Cond.		1180	1120	1120	1120	1100
	Temp(C)		15.0	15.0	15.0	15.0	15.0
40	pH		7.9	7.9	7.9	8.0	7.4
	O2 ppm		9.5	9.6	9.7	9.4	9.2
	Cond.		800	800	800	800	800
	Temp(C)		15.0	15.0	15.0	15.0	15.0
30	pH		7.7	7.8	7.9	8.0	7.4
	O2 ppm		9.4	9.7	9.8	9.5	9.3
	Cond.		680	660	660	660	680
	Temp(C)		15.0	15.0	15.0	15.0	15.0
20	pH		7.8	7.8	7.9	8.0	7.4
	O2 ppm		9.6	9.7	9.7	9.7	9.3
	Cond.		540	500	520	520	550
	Temp(C)		15.0	15.0	15.0	15.0	15.0
10	pH		7.5	7.6	7.7	7.9	7.4
	O2 ppm		9.5	9.7	9.8	9.7	9.3
	Cond.		390	380	385	380	390
	Temp(C)		15.0	15.0	15.0	15.0	15.0
Control	pH		7.0	7.4	7.6	7.5	7.4
	O2 ppm		9.6	9.6	9.8	9.7	9.3
	Cond.		260	260	260	260	260
	Temp(C)		15.0	15.0	15.0	15.0	15.0

COMPANY: Texaco Canada Inc., Nanticoke
(520205)
(now with Nanticoke Refinery)
SECTOR: Petroleum Refining
REGION: West Central

SUMMARY

Data for six Daphnia magna acute lethality toxicity tests conducted on samples of Process Effluent collected between December 1988 and May 1989 were submitted by Texaco Canada Inc. in Nanticoke. All six samples were not acutely lethal to Daphnia magna.

Process Effluent

06881225 sampled: 12/12/88 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

06890127 sampled: 01/24/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

06890211 sampled: 02/06/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no immobilty observed during testing

06890309 sampled: 03/07/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or immobility observed in 48 Hrs

06890406 sampled: 04/04/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or immobility observed in 48 Hrs

06890530 sampled: 05/09/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: no mortality or immobility observed

02890108 sampled: 05/31/89 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

storm water

landfarm leachate

EO-leachate-creek

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 06881225

TEST CONDITIONS

Company : Texaco Canada Inc.
Nanticoke, ONT
(520205)
Region : West Central
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : BEAK
Sampling Method : 24hr. Comp
Sampled By : Texaco
Date Collected : 12/12/88
Received : 12/12/88
Tested : 12/14/88 at: 1100

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	24:00	48:00	TOTAL MORTALITY %
100	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By :

TOXICITY TEST PARAMETERS

Sample Number: 06881225

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
100	pH	7.8		8.1
	O2 ppm	7.0		6.1
	Cond.	1308		1285
	Temp(C)	20.0	20.0	20.0
50	pH	8.0		8.1
	O2 ppm	7.0		6.3
	Cond.	826		815
	Temp(C)	20.0	20.0	20.0
30	pH	8.0		8.1
	O2 ppm	7.1		6.5
	Cond.	633		648
	Temp(C)	20.0	20.0	20.0
20	pH	8.0		8.1
	O2 ppm	7.2		6.7
	Cond.	534		550
	Temp(C)	20.0	20.0	20.0
10	pH	8.0		8.0
	O2 ppm	6.1		5.7
	Cond.	435		362
	Temp(C)	20.0	20.0	20.0
Control	pH	8.2		7.6
	O2 ppm	6.9		6.5
	Cond.	339		335
	Temp(C)	20.0	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 06890127

TEST CONDITIONS

Company : Texaco Canada Inc.
Nanticoke, ONT
(520205)
Region : West Central
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Beak
Sampling Method : grab
Sampled By : Rob Bumelis
Date Collected : 01/24/89
Received : 01/25/89
Tested : 01/25/89 at: 1600

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	24:00	48:00	TOTAL MORTALITY %
100	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890127

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
100	pH	8.2		8.6
	O2 ppm	8.6		8.6
	Cond.	3190		3240
	Temp(C)	21.0	21.0	20.0
50	pH	8.2		8.5
	O2 ppm	8.6		8.5
	Cond.	1855		1757
	Temp(C)	21.0	21.0	20.0
30	pH	8.2		8.4
	O2 ppm	8.7		8.9
	Cond.	1211		1181
	Temp(C)	21.0	21.0	20.0
20	pH	8.3		8.3
	O2 ppm	8.6		8.5
	Cond.	1041		963
	Temp(C)	21.0	21.0	20.0
10	pH	8.2		8.2
	O2 ppm	8.6		8.8
	Cond.	682		663
	Temp(C)	21.0	21.0	20.0
Control	pH	8.1		7.9
	O2 ppm	8.4		8.7
	Cond.	405		405
	Temp(C)	21.0	21.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 06890211

TEST CONDITIONS

Company : Texaco Canada Inc.
Nanticoke, ONT
(520205)
Region : West Central
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Beak
Sampling Method : grab
Sampled By : Rob Bumelis
Date Collected : 02/06/89
Received : 02/07/89
Tested : 02/07/89 at: 1410

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. OME, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no immobilty observed during testing

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890211

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
100	pH	7.8		8.2
	O2 ppm	8.8		8.6
	Cond.	1831		1842
	Temp(C)	20.0	20.0	20.0
50	pH	8.0		8.1
	O2 ppm	8.7		8.5
	Cond.	1129		1140
	Temp(C)	20.0	20.0	20.0
30	pH	8.1		8.1
	O2 ppm	8.5		8.4
	Cond.	814		854
	Temp(C)	20.0	20.0	20.0
20	pH	8.1		8.1
	O2 ppm	8.6		8.4
	Cond.	666		679
	Temp(C)	20.0	20.0	20.0
10	pH	8.1		8.2
	O2 ppm	8.2		8.3
	Cond.	538		540
	Temp(C)	20.0	20.0	20.0
Control	pH	8.0		8.0
	O2 ppm	8.6		8.4
	Cond.	328		335
	Temp(C)	20.0	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 06890309

TEST CONDITIONS

Company	: Texaco Canada Inc. Nanticoke, ONT (520205)
Region	: West Central
Industry	: Petroleum Refining
Control point	: Process Effluent, (200)
Laboratory	: Beak
Sampling Method	: grab
Sampled By	: Rob Bumelis
Date Collected	: 03/07/89
Received	: 03/08/89
Tested	: 03/08/89 at: 1620
Type of Bioassay	: STATIC (Daphnia magna Acute Lethality Toxicity Test Protocol. OME, 1988)
Test Animal	: D. magna
Weight(gm)	:
Length(mm)	:

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or immobility observed in 48 Hrs

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890309

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
100	pH	7.8		7.6
	O2 ppm	9.1		8.0
	Cond.	1974		1990
	Temp(C)	20.0	20.0	20.0
50	pH	7.8		7.8
	O2 ppm	9.0		8.1
	Cond.	1152		1155
	Temp(C)	20.0	20.0	20.0
30	pH	7.8		7.8
	O2 ppm	8.6		7.0
	Cond.	819		824
	Temp(C)	20.0	20.0	20.0
20	pH	7.8		7.9
	O2 ppm	8.5		7.0
	Cond.	645		652
	Temp(C)	20.0	20.0	20.0
10	pH	7.8		8.0
	O2 ppm	8.7		7.4
	Cond.	510		511
	Temp(C)	20.0	20.0	20.0
Control	pH	7.7		8.0
	O2 ppm	9.0		7.6
	Cond.	341		345
	Temp(C)	20.0	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 06890406

TEST CONDITIONS

Company	: Texaco Canada Inc. Nanticoke, ONT (520205)
Region	: West Central
Industry	: Petroleum Refining
Control point	: Process Effluent, (200)
Laboratory	: Beak
Sampling Method	: grab
Sampled By	: Rob Bumelis
Date Collected	: 04/04/89
Received	: 04/05/89
Tested	: 04/05/89 at: 1330
Type of Bioassay	: STATIC (Daphnia magna Acute Lethality Toxicity Test Protocol. OME, 1988)
Test Animal	: D. magna
Weight(gm)	:
Length(mm)	:

MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or immobility observed in 48 Hrs

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890406

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
100	pH	8.0		8.1
	O2 ppm	9.4		8.2
	Cond.	2220		2220
	Temp(C)	20.0	20.0	20.0
50	pH	8.2		8.2
	O2 ppm	9.2		8.4
	Cond.	1298		1299
	Temp(C)	20.0	20.0	20.0
30	pH	8.3		8.2
	O2 ppm	9.1		8.4
	Cond.	946		957
	Temp(C)	20.0	20.0	20.0
20	pH	8.4		8.2
	O2 ppm	9.1		8.7
	Cond.	761		771
	Temp(C)	20.0	20.0	20.0
10	pH	8.5		8.2
	O2 ppm	9.4		8.8
	Cond.	568		576
	Temp(C)	20.0	20.0	20.0
Control	pH	8.5		8.2
	O2 ppm	9.3		8.6
	Cond.	388		393
	Temp(C)	20.0	20.0	20.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 06890530

TEST CONDITIONS

Company	: Texaco Canada Inc. Nanticoke, ONT (520205)
Region	: West Central
Industry	: Petroleum Refining
Control point	: Process Effluent, (200)
Laboratory	: Beak
Sampling Method	: grab
Sampled By	: Rob Bumelis
Date Collected	: 05/09/89
Received	: 05/10/89
Tested	: 05/10/89 at: 1530
Type of Bioassay	: STATIC (Daphnia magna Acute Lethality Toxicity Test Protocol. OME, 1988)
Test Animal	: D. magna
Weight(gm)	:
Length(mm)	:

MORTALITY DATA

TEST CONC. %	ELAPSED TIME 00:00	24:00	48:00	TOTAL MORTALITY %
100	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or immobility observed

SLOPE of Mortality Curve :
LC50 Calculated By : moving average

TOXICITY TEST PARAMETERS

Sample Number: 06890530

TEST CONC. %		ELAPSED TIME 00:00	24:00	48:00
100	pH	7.8		8.1
	O2 ppm	8.9		8.2
	Cond.	1484		1467
	Temp(C)	21.0	21.0	21.0
50	pH	8.0		8.1
	O2 ppm	8.4		8.1
	Cond.	903		902
	Temp(C)	21.0	21.0	21.0
30	pH	8.1		8.2
	O2 ppm	8.5		8.1
	Cond.	667		663
	Temp(C)	21.0	21.0	21.0
20	pH	8.2		8.2
	O2 ppm	8.5		8.0
	Cond.	554		568
	Temp(C)	21.0	21.0	21.0
10	pH	8.2		8.2
	O2 ppm	8.4		8.2
	Cond.	439		442
	Temp(C)	21.0	21.0	21.0
Control	pH	7.3		8.1
	O2 ppm	8.5		8.2
	Cond.	327		323
	Temp(C)	21.0	21.0	21.0

MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 02890108

TEST CONDITIONS

Company : Texaco Canada Inc.
Nanticoke, ONT
(520205)
Region : West Central
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : MOE
Sampling Method : grab
Sampled By : I. G. Perkons
Date Collected : 05/31/89
Received : 05/31/89
Tested : 05/31/89 at: 1210

Type of Bioassay : STATIC
(Daphnia magna Acute Lethality Toxicity
Test Protocol. ONE, 1988)

Test Animal : D. magna
Weight(gm) :
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME				TOTAL MORTALITY
%	00:00	01:00	24:00	48:00	%
100	0	0	0	0	0
60	0	0	0	0	0
30	0	0	0	0	0
15	0	0	0	0	0
5	0	0	0	0	0
Control	0	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : MISA Audit

SLOPE of Mortality Curve :
LC50 Calculated By : none

TOXICITY TEST PARAMETERS

Sample Number: 02890108

TEST CONC.		ELAPSED TIME			
%		00:00	01:00	24:00	48:00
100	pH	8.0			8.4
	O2 ppm	9.3			8.4
	Cond.	1177			1159
	Temp(C)	20.0	20.0	20.0	20.0
60	pH	8.1			8.3
	O2 ppm	9.4			8.5
	Cond.	816			798
	Temp(C)	20.0	20.0	20.0	20.0
30	pH	8.1			8.4
	O2 ppm	9.6			8.6
	Cond.	562			568
	Temp(C)	20.0	20.0	20.0	20.0
15	pH	8.2			8.3
	O2 ppm	9.6			8.6
	Cond.	442			440
	Temp(C)	20.0	20.0	20.0	20.0
5	pH	8.2			8.3
	O2 ppm	9.6			8.4
	Cond.	351			350
	Temp(C)	20.0	20.0	20.0	20.0
Control	pH	8.2			8.2
	O2 ppm	9.7			8.4
	Cond.	311			345
	Temp(C)	20.0	20.0	20.0	20.0